

# SERVICE MANUAL

IMPORTANT INFORMATION, KEEP FOR OPERATOR

This manual provides information for:



## **MODELS VRC-3E & VRC-6E *Domestic* VORTEX100® CONNECTIONLESS STEAMER**

- Self Contained
- Electric Heated
- Capacity: VRC-3E=3 Steamer Pans Per Cavity  
VRC-6E=6 Steamer Pans Per Cavity

Information contained in this document is known to be current and accurate at the time of printing/creation. Unified Brands recommends referencing our product line websites, [unifiedbrands.net](http://unifiedbrands.net), for the most updated product information and specifications.

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# GROEN®



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## 1.1 The Groen Service Concept

Since 1907 Groen has been in the business of designing and manufacturing the finest commercial appliances for the food service industry. Chefs, cooks and kitchen support personnel have come to depend upon the quality of construction and the reliability of operation.

Groen, in turn, depends upon our service centers and their field service personnel to keep the equipment in top operating condition. In order to do this, our designs are made with service and reliability in mind.

Once the Groen equipment is sold, manufactured, delivered and installed, our reputation is clearly in your hands. As part of our team, we value your efforts and input to our product design.

We will do all we can to make your job of keeping the equipment in perfect working order as easy as we can. Together, we will keep our customers satisfied.

## 1.2 Groen Certified Service

The Vortex100 Connectionless Steamer has been carefully designed to provide many years of efficient and reliable service. Part of the quality program is Groen Certified Service. This includes:

- Groen certifies that all equipment delivered to our customers has been inspected and tested for compliance with the specifications.
- Groen certifies that all parts required for service and maintenance will be readily available.
- Groen certifies that this manual will be updated by means of periodic service bulletins to provide the most up-to-date information for field maintenance and service personnel.

## 1.3 Warranty & Non-Warranty Repair

Groen Warranty provisions are clearly presented in the customer's Operator Manual.

Certain procedures for the cleaning and/or adjustment of the Vortex Connectionless Steamer are presented in this manual for reference, but not warranty related.



This non-warranty symbol is used throughout the manual to tell you which items and activities are NOT covered by the equipment warranty.

## 1.4 Safety

The Groen Vortex100 Connectionless Steamer has been designed from the start with safety in mind. This includes safety to the operating and maintenance personnel, safety to the facility in which the equipment is installed and safety to the equipment itself.

The steamer has been designed to the highest industry standards and has been certified by the National Sanitation Foundation Testing Laboratory (NSF) and the Underwriters Laboratory (UL) to assure strict compliance.

The steamer contains several devices, which are specifically used to prevent unsafe conditions. If they are disconnected, make sure they are reinstalled properly and tested before the steamer is operated.

The safety precautions in this manual are in accordance with ANSI 535 Standard. Three different signal words alert you to a hazardous situation: **DANGER, WARNING, AND CAUTION**

**DANGER:** The signal word **DANGER** indicates that a hazardous situation is about to happen and, if not avoided, will result in death or serious injury.

- Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.
- When you open the steamer door, be very careful to avoid escaping steam. Steam can cause burns.
- After removing the fan baffle partition, do not put your hands or other object into the cooking cavity until the fan comes to a complete stop. Rotating fan blades can cause severe injury!

**WARNING:** The signal word **WARNING** tells you that a possibly hazardous situation is about to take place which, if not avoided, could cause death or serious injury.

- Always turn off the steamer power before removing and partitions or panels.
- Disconnect the steamer from the power source before performing and internal service work.

**CAUTION:** The signal word **CAUTION** warns you of a hazardous situation which, if not avoided, may result in minor or moderate injury.

- Steamer may be hot. Take precautions to prevent any contact with hot surfaces.
- Be sure all interior partitions have been installed before operating the steamer.
- All steamer operators and service personnel should be familiar with correct and safe operating procedures.
- Be sure steamer drain is not blocked as this could result in improper steamer operations.

Two other signal words, not directly related to personal safety, are also used in this manual: **NOTICE** and **IMPORTANT**.

**NOTICE** is used to alert you to hazards that may result in component and/or equipment damage.

**IMPORTANT** is used to highlight an operating or maintenance tip or suggestion.

## 1.5 Glossary of Terms

The following abbreviations and terms are used in this manual:

|               |                                   |
|---------------|-----------------------------------|
| <b>BTU</b>    | British Thermal Unit              |
| <b>GPM</b>    | Gallons Per Minute                |
| <b>LED</b>    | Lighting Emitting Diode           |
| <b>MM</b>     | Millimeter                        |
| <b>NEC</b>    | National Electric Code            |
| <b>N.P.T.</b> | National Pipe Thread              |
| <b>NSF</b>    | National Sanitation Foundation    |
| <b>PSI</b>    | Pounds per Square Inch (Pressure) |
| <b>U.L.</b>   | Underwriter's Laboratory, Inc.    |

## 1.6 Tools and Supplies

This Section identifies the tools, instruments and supplies which will be required and useful in the inspection, repair and testing of the equipment described in this manual.

Most likely many of these tools and supplies are already in your tool kits and are used in everyday maintenance. Make sure to use only the specified sealants, compounds and dressings.

**CAUTION:** Care should be taken in using the correct tool as indicated. Using the wrong tool may inflict damage to the part being removed, installed and/or adjusted. Make sure that the calibrations on instruments are periodically checked for accuracy.

### 1.6.1 Required Tools

- Screw Drivers: Flat Blade No. 1 and No. 2
- Phillips No. 1 and No. 2
- Socket Wrenches: 1/4" through 7/8" (Magnetic)
- Nutdrivers (metric and inches)
- Open Ended Wrenches: 1/4" through 7/8"
- Pipe Wrenches: 6" and 8" size
- Allen Wrenches: 1/16" through 1/4"
- Slip Joint Pliers: ChannelLock or Equivalent
- Wire Crimpers

### 1.6.2 Recommended Instruments

- Digital Multimeter: Fluke Model 77

### 1.6.3 Helpful Hardware

- Extension Mirror
- Screw Starter
- Level: 18" Model
- Fuse Puller

## 1.6.4 Recommended Supplies

- Pipe Thread Compound: Brand: LACO PipeTite Stik No. 11176 or equivalent
- Motor Sealant Grease: Bel-Ray
- 2" Aluminum Duct Tape
- Removable Thread Locker:
  - Locktite Type 242 (Door)
  - Locktite Type 222 (Exterior)
- Clear Silicone Sealant:
  - Dow Corning Type 732
- Silicone Heat Sink Compound:
  - Non-Fluid Oil Corp., Chemplex 1381
- High Temperature Anti-Seize and Lubricating Compound
  - Bostix NEVER SEEZ NSBT-16

## 1.7 How To Use This Manual

Read this manual completely before attempting any disassembly or repairs.

Please note the similarities and differences between the various models described in the manual.

Before making repairs, you should have knowledge of the steamer operation as described in the Operations Section of this manual, and a good understanding of service techniques, as presented by the Groen Service School.

This service manual should be taken with you on all service calls. Use the correct tools in accordance with the procedures shown and use only Groen Certified Replacement Parts when performing steamer repairs.

## 1.7.1 Technical Bulletins

Technical bulletins are issued by Groen to provide additional and specific technical information to this manual. The technical Bulletin Section of this manual should be used to file all of the Technical Bulletins sent to you from the factory.

When you receive a Technical Bulletin, insert the bulletin in the Technical Bulletin Section of this manual, and write a note in the margin of the page in this manual which is appropriate to the subject covered by the bulletin.

1.7.1a

## 2.1 Controls

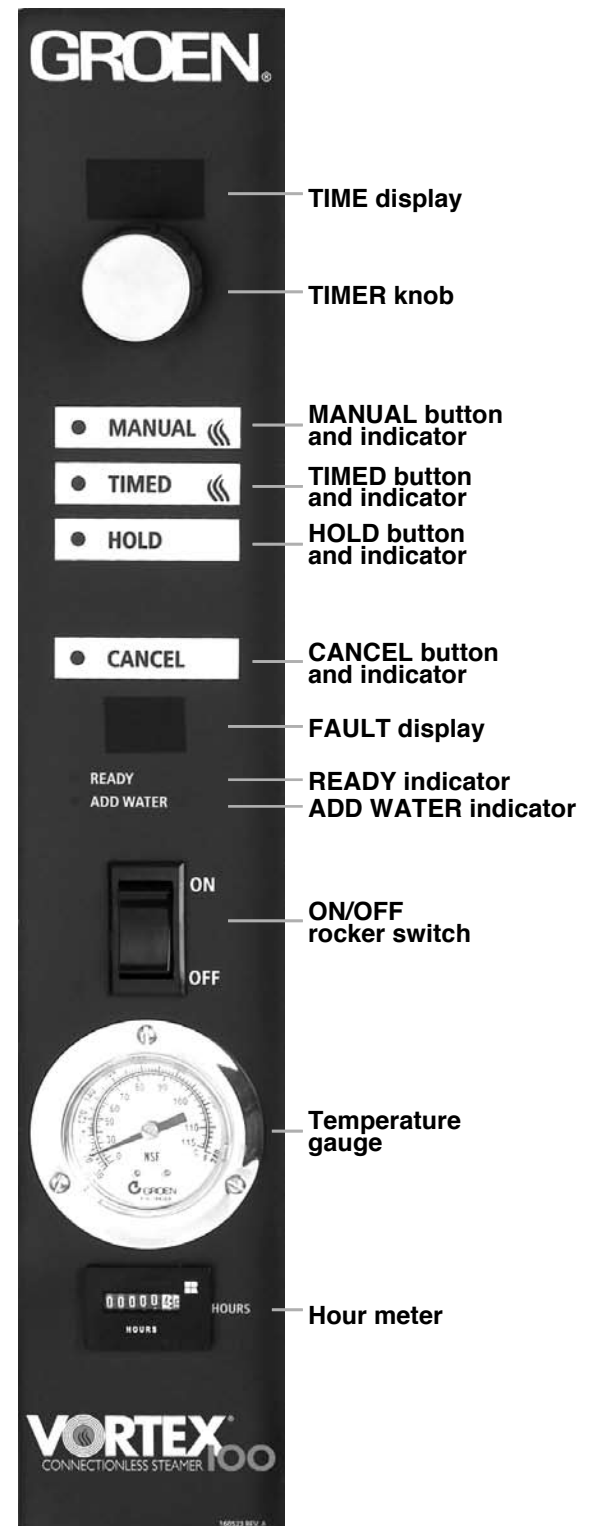
Operator controls are on the front right of the unit.

The VRC-3E and VRC-6E control panels have the following touch pads and indicator lights:

- The ON/OFF rocker switch gets the Vortex ready for use, or shuts it off.
- The HOLD indicator light shows that the cavity is at holding temperature.
- The TIMED indicator light stays on when the timer is running.
- The low water float probe signals the ADD WATER indicator light to illuminate when it's time to add water.
- The open and closed position of the drain valve allows the unit to be filled with water or drained.
- The READY indicator light indicates the unit has achieved the ready temperature.
- Hour meter records cumulative hours of operation.
- Temperature gauge indicates internal temperature of cavity.

### The push button operations:

1. In the HOLD mode the steam generator stays at a low boil or "holding" temperature. Factory set at 160°F.
2. When the TIMED button is pushed set, the TIMED light will illuminate and can be set by turning the knob. The unit steams until the timer counts down to zero and goes into hold. At that time the HOLD light illuminates and a beeper sounds.
3. When the MANUAL button is pushed the unit steams continuously. The green MANUAL light will stay illuminated.
4. CANCEL button should be pushed to stop beeping.



## 2.2 Operating Procedure

1. Push the ON switch and make sure drain handle is in the closed position.
2. (When manual filling only) Pour water into the reservoir. When the water level comes up to the high float the reservoir is full and 5 beeps will sound and the ADD WATER light will go off. Close the door. The contactor will turn on when the low float is satisfied and the door is closed.
3. The contactor can be heard cycling to pulse energy into the heating elements. The unit will be ready in about 20 minutes.
4. Load food into pans in uniform layers. Pans should be filled to about the same levels, and should not be mounded.
5. Open the door and slide the pans onto the supports. If you will only be steaming one pan, put it in the middle position. Some foods will cause foam. When cooking foods that foam, such as shrimp, put an empty solid 2" deep pan in the bottom slot of the pan racks.
6. Close the door and take one of the following steps:
  - If you want to steam the food for a certain length of time, push the TIMED button and set the time with timer knob. The timer will automatically run the steamer for the set time and then go into hold. A beeper will sound. Then push CANCEL to stop the beeping.
  - If you want to steam continuously, push MANUAL button. The green light will illuminate. The unit will continue steaming at a temperature of 203° F or higher.
  - If you want to maintain food at holding temperature push the HOLD button.
6. To remove pans from cavity, open the door. Remove the pans from the steamer, using hot pads or oven mitts to protect your hands from the hot pans.
7. To shut off the unit, push the OFF switch.
8. To drain the remaining water in the water reservoir, move the drain handle to the OPEN position. The drain pan will not hold all of the water in the reservoir. Allow water to cool before draining. Pull drain pan slowly from the unit to avoid spilling.

**WARNING**  
**Do not empty until water is cool.**  
**Empty drain pan. Pan will not hold**  
**all water from the reservoir.**  
**Do not over fill drain pan.**

**WARNING**  
**When you open the door,**  
**stay away from the steam**  
**coming out of the unit.**  
**the steam can cause burns.**

## 3.1 Installation and Start-up

## Branch Circuit Protection

**CAUTION**  
**DO NOT INSTALL THE UNIT WITHIN**  
**2 INCHES OF A HEAT SOURCE**  
**(SUCH AS A BRAISING PAN, DEEP FAT**  
**FRYER, CHARBROILER, OR KETTLE).**

Electrical Supply Connection – Observe all local, national, or other applicable codes.

Three phase models of the Vortex100 Connectionless Steamer are supplied with a cord set ready to be connected to a power supply. See the chart below for the correct matching receptacle (not supplied with the unit).

Single phase models are designed to be directly connected (hard wired) to the electrical supply. Allow sufficient loop in the flexible conduit to facilitate inspection, servicing, and cleaning.

### Field Wiring Table

Use copper wire only – insulation rating 90°C

| Voltage<br>60 hz only | Phase | Rated Current<br>Demand (amps) |        |        |      |     |
|-----------------------|-------|--------------------------------|--------|--------|------|-----|
|                       |       | VRC-3E                         |        | VRC-6E |      |     |
|                       |       | 9KW                            | 6.76KW | 12KW   | 10KW | 9KW |
| 208                   | 3     | 25                             | 19     | 34     | 28   | 25  |
| 240                   | 3     | 22                             |        | 29     | 25   | 22  |
| 480                   | 3     | 11                             |        | 14.4   | 13   |     |
| 208                   | 1     | 44                             | 33     | 58     | 49   | 44  |
| 240                   | 1     | 38                             |        | 50     | 43   | 39  |

### WARNING

#### GROUNDING INSTRUCTIONS

**This appliance must be connected to a grounded metallic, permanent wiring system, or an equipment grounding conductor must be run with the circuit conductors and connected to the equipment grounding terminal on the station.**

### Plug & Receptacle Chart

Three Phase Only

| Volts | Phase | Plug    |         |                                    | Receptacle |         |                                   |
|-------|-------|---------|---------|------------------------------------|------------|---------|-----------------------------------|
|       |       | 9KW     | 10KW    | 12KW                               | 9KW        | 10KW    | 12KW                              |
| 208   | 3     | 15-50P  | 15-50P  | 15-50P                             | 15-50R     | 15-50R  | 15-50R                            |
| 240   | 3     | 15-30P  | 15-50P  | 15-50P                             | 15-30R     | 15-50R  | 15-50R                            |
| 480   | 3     | L16-20P | L16-20P | CS8165C<br>Hubbel or<br>Equivalent | L16-20R    | L16-20R | CS8169<br>Hubbel or<br>Equivalent |

## Water Connections(s)

### • Units with Manual Fill

No water connection is needed. The water will be poured directly into the water cavity reservoir.

### • Units with Auto-Fill

Make sure that the incoming water connection is made with a 3/4" N.H. COLD water supply hose. Rigid pipe is not required. The water pressure should be between 30 and 60 PSIG. Higher pressures will require the use of a pressure regulator. Make sure that all connections are tight with no leaks-no matter how small.

**NOTICE:** The quality of the water is a factor in the proper performance of the steamer. The water supply should have a minimum value of 30-40 parts per million of total dissolved solid (TDS).

## Drain Connection

The Vortex100 Connectionless Steamer should be manually drained to the bottom containment pan supplied by the factory. If the unit is connected to a drain, do not connect more than two units to one drain line or pressure from one unit will effect the second unit.

## Steam Vent Assembly Instructions

Remove steam diverter assembly from literature bag which can be found inside unit. Slide loose end as shown over unit steam outlet, tighten worm gear clamp with flat head screw driver. Be sure steam outlet is pointing in the upward position. (Shown below)

## Drain Line Installation

Units with auto-fill or manual with drain kit

The drain line should not be less than:

1-1/2" - for single units

2" (5E) - for double stacked units

There must be a 2" air gap to the (non-pressurized) building drain. Make sure that the drain is sloped AWAY and DOWN from the steamer and that there are no obstruction in the line. Failure to observe these requirements may cause a water trap in the drain line and produce enough back pressure to prevent proper cavity draining-resulting in condensate water leaking from the door. Drain line must not **NOT** be made of plastic pipe. It must be able to withstand boiling water.

## Stacking Units Instructions

Remove drain containment pan from the bottom of unit(s). Unscrew to remove adjustable legs from base of Vortex unit(s). Unfasten nuts and bolts on stand platform(s). Place Vortex unit(s) on stand platform. Align the (4) leg holes with the holes in the platform. Secure Vortex units(s) to stand platform(s) using bolts and washers provided with stand, see drawing below.

## For double stack units only:

By loosening the left screw and removing the right screw provided, mount steam exhaust bracket assembly to the back panel of the top Vortex100 unit as shown in detail "B" of Figure 1 on the next page. Attach the steam exhaust hose from the bottom Vortex unit's steam outlet tube to the top Vortex unit's steam exhaust bracket assembly using hose clamps provided as shown in figure 2 on the next page. (Note: Steam exhaust hose may need to be cut to fit.)

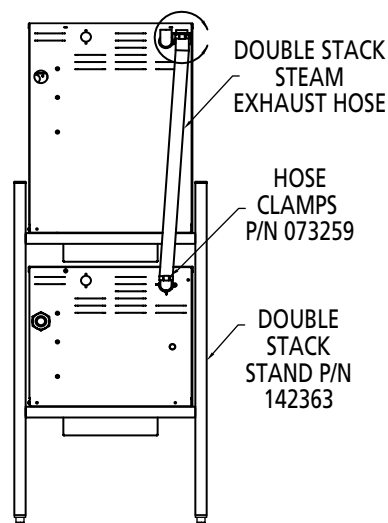


FIGURE 2

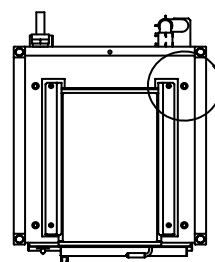
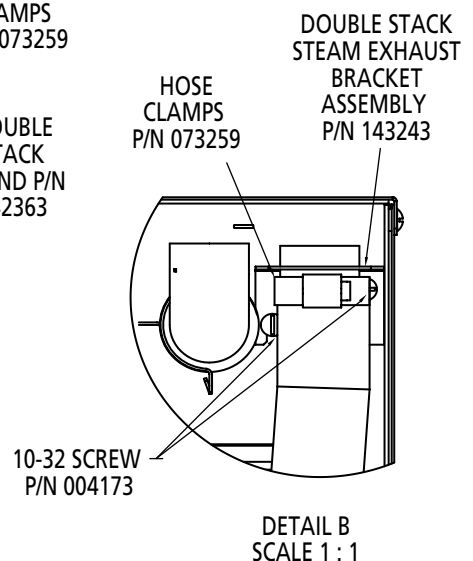


FIGURE 1



## 3.2 Installation Checklist

### General

- \_\_\_\_\_ Remove all packaging.
- \_\_\_\_\_ Make sure there is a minimum of 2 inches of free space around the steamer.
- \_\_\_\_\_ Make sure the steamer is level or pitched slightly to the rear.
- \_\_\_\_\_ Check that the fan is clean and clear of foreign material.

### Electrical Checks

- \_\_\_\_\_ Make sure the steamer is properly grounded.
- \_\_\_\_\_ Verify that the electrical connections conform to all local codes and the NEC requirements.
- \_\_\_\_\_ Make sure the power supply branch circuit conforms to the specifications indicated on the steamer nameplate.

### Steamer Door Check

- \_\_\_\_\_ Make sure the door gasket is making good contact with the cavity frame.
- \_\_\_\_\_ Check that the operators are leaving the door open when the steamer is shut down overnight or longer.

## 3.3 Cleaning

To keep your VRC-3E or VRC-6E Connectionless Steamer in proper working condition, use the following procedure to clean the unit.

### A. Suggested Tools

- Mild detergent
- Stainless steel exterior cleaner such as Zepper
- Cloth or sponge
- Plastic or wood handle brush with soft bristles
- Spray bottle
- Measuring cup
- Nylon pad
- Towels
- Plastic disposable gloves

### B. Procedure

#### Exterior Cleaning

- a. Prepare a warm solution of the mild detergent as instructed by the supplier. Wet a cloth with this solution and wring it out. Use the moist cloth to clean the outside of the unit. Do not allow freely running liquid to touch the controls, the control panel, any electrical part, or on the side or rear panels.
- b. To remove material which may be stuck to the unit use plastic, wool, a fiber brush, or a plastic or rubber scraper with a detergent solution.

#### Interior Cleaning

Clean the unit daily or as residue builds upon the bottom of the oven cavity.

- a. Press OFF to turn the steamer off. Open the door.
- b. Drain the water from the unit into the drain pan and allow the unit to cool before cleaning. (Note: If the cavity is full of water, the drain pan will not hold the entire amount and must be emptied more than once.)
- c. After the unit has cooled, remove pan and pan racks from the cavity.
- d. Use a mild detergent to wipe down the steamer cavity, the floats on the inside back panel wall, and the pan racks. The use of Groen descaler/delimer may be required to remove heavy scale deposits
- e. Rinse the unit to remove detergent and cleaners.
- f. Attach pan racks. Unit is ready for use.

**WARNING**

**Keep water and cleaning solutions out of controls and electrical components. Never hose or steam clean any part of the unit.**

**Even when the unit has been shut off, don't put hands or tools into the cooking chamber until the fan has stopped turning.**

**Don't operate the unit unless the removable partition has been put back in its proper location.**

**Do not use any acidic cleanser products to clean the unit.**

**IMPORTANT**

Do not use any metal material (such as metal sponges) or metal implements (such as a spoon, scraper or wire brush) that might scratch any stainless steel surface. Scratches make the surface hard to clean and provide places for bacteria to grow. Do not use steel wool, which may leave particles imbedded in the surface which could eventually cause corrosion and pitting.

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[illegible]

## 4.1 Vortex100 Troubleshooting Procedure

Each test procedure builds on the prior ones. Always start at the beginning of this procedure, and continue until the results indicate a malfunction. Do not skip steps.

**WARNING:** Disconnect electrical power before servicing.

| SETUP                                                               | EXPECTED RESULTS                                                                       | PROBABLE DEFECT                                                               | TEST or COMMENTS                                                                                       |
|---------------------------------------------------------------------|----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| Measure input voltage and compare to rating plate.                  | Input voltage is within 10% of rated voltage                                           | Wrong model (voltage) installed                                               | Notify customer                                                                                        |
| Check input power to determine if it is three phase or single phase | Steamer wiring matches incoming power                                                  | Wrong model ordered. Change wiring at terminal block to match incoming power. | When converting from three phase to single phase, do not exceed amperage of breaker or power cord/plug |
| Connect electrical power (circuit breaker or plug)                  | Panel lights are off.<br>Red LED on back of control board flashes about once a second. | No line voltage                                                               | Standard test                                                                                          |
|                                                                     |                                                                                        | Blown 6 amp fuse F1 or F2                                                     | Standard test                                                                                          |
|                                                                     |                                                                                        | <i>480v unit only-torroid circuit breaker</i>                                 | <i>Reset breaker</i>                                                                                   |
|                                                                     |                                                                                        | <i>480v unit only-torroid transformer</i>                                     | <i>Measure 480vac in and 208+/- 10%vac out</i>                                                         |
|                                                                     |                                                                                        | 24 volt control transformer circuit breaker                                   | Measure 208 or 240vac in and 24vac +/- 20% out                                                         |
|                                                                     |                                                                                        | Control board or relay board                                                  | Substitute to test                                                                                     |
|                                                                     |                                                                                        | Incorrect wiring                                                              | Check wiring diagram                                                                                   |
|                                                                     |                                                                                        | Ribbon connector is not properly seated                                       | Push ribbon connector into socket on control board and relay board                                     |
| Press on/off switch to ON                                           | Heartbeat LED Flashes                                                                  | Breaker on 24 Volt transformer                                                | Reset breaker                                                                                          |
|                                                                     |                                                                                        | 24 volt transformer T1                                                        | Measure 208 or 240vac in and 24vac +/- 20% out                                                         |
| Add water to cover high water (upper) float. Close door             | ADD WATER light goes out (manual fill only)                                            | Low or high water float                                                       | Run sensor diagnostics                                                                                 |

| SETUP                                                   | EXPECTED RESULTS                                                                                | PROBABLE DEFECT                         | TEST or COMMENTS                                                                                                                     |
|---------------------------------------------------------|-------------------------------------------------------------------------------------------------|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| Factory optional water fill kit.<br>Close door.         | Water fills to high water float                                                                 | High water float                        | Use sensor diagnostics                                                                                                               |
|                                                         |                                                                                                 | Water fill solenoid valve               | Use 02 diagnostic to test valve                                                                                                      |
|                                                         |                                                                                                 | Incorrect wiring                        | Check per wiring diagram                                                                                                             |
|                                                         |                                                                                                 | Control or relay board                  | Substitute to test                                                                                                                   |
| Close door and set timer to 30 minutes                  | Timing display illuminates. After about 15 minutes the ready light illuminates and the fan runs | Door switch                             | Use sensor diagnostic                                                                                                                |
|                                                         |                                                                                                 | Relay board                             | Use 07 diagnostic                                                                                                                    |
|                                                         |                                                                                                 | Start capacitor                         | Standard test                                                                                                                        |
|                                                         |                                                                                                 | Internal thermal protector on fan motor | Measure black to white motor leads. 35 +/- 20% ohms                                                                                  |
|                                                         |                                                                                                 | Fan Motor                               | Measure orange to brown motor leads. 35 +/-20% ohms. Red to blue 42 +/- 20% ohms                                                     |
|                                                         |                                                                                                 | Incorrect wiring                        | Check per wiring diagram                                                                                                             |
| Look for temperature rise on the dial temperature gauge | Heats to 200 + degrees in 22 +/- 5 minutes                                                      | Hi-limit thermostat                     | Use sensor diagnostic                                                                                                                |
|                                                         |                                                                                                 | Contactors K3                           | Use 05 diagnostic with power switch on and lower float up.<br>Verify 24vac across K3 Coil.<br>Measure amperage through heater wires. |

| SETUP                                                   | EXPECTED RESULTS                                                                                    | PROBABLE DEFECT                                               | TEST or COMMENTS                                                                                                                                                                                                                                               |
|---------------------------------------------------------|-----------------------------------------------------------------------------------------------------|---------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Look for temperature rise on the dial temperature guage | Heats to 200 + degrees in 22 +/- 5 minutes                                                          | Heater element                                                | Measure amperage for each leg and compare to the chart on next page. If amperage is incorrect, disconnect power, measure heater resistance (cold), and compare to the chart on next page. If resistance is not within 20% of specified, replace heater element |
|                                                         |                                                                                                     | Incorrect wiring                                              | Check per wiring diagram                                                                                                                                                                                                                                       |
|                                                         | No defect found but customer complaint is that unit is slow to heat                                 | Customer may be opening door frequently to add or remove food | Talk with customer                                                                                                                                                                                                                                             |
|                                                         |                                                                                                     | Line voltage may be low                                       | Measure line voltage                                                                                                                                                                                                                                           |
| Set timer to one minute                                 | Timer colon flashes times out, HOLD light illuminates, and unit beeps until CANCEL button is pushed | Not at ready temperature or door is open                      | Close door, wait for ready                                                                                                                                                                                                                                     |
|                                                         |                                                                                                     | Control board                                                 | Substitute to test                                                                                                                                                                                                                                             |
|                                                         |                                                                                                     | Incorrect wiring                                              | Check per wiring diagram                                                                                                                                                                                                                                       |
| Push MANUAL                                             | MANUAL light illuminates and timer displays dashes                                                  | Control board                                                 | Substitute to test                                                                                                                                                                                                                                             |

**CONGRATULATIONS!**  
The unit is operating correctly.

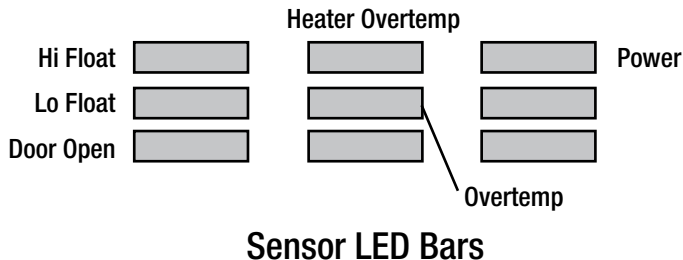
## AMPERAGE / RESISTANCE CHART

| Model / Voltage / Phase |                  | Amperage |      |      |        | Resistance |      |      |        |
|-------------------------|------------------|----------|------|------|--------|------------|------|------|--------|
|                         |                  | 12KW     | 10KW | 9KW  | 6.76KW | 12KW       | 10KW | 9KW  | 6.76KW |
| VRC-6E                  | 208 Three Phase  | 34       | 28   | 25   |        | 10.8       | 13.0 | 14.4 |        |
| VRC-6E                  | 240 Three Phase  | 29       | 25   | 22   |        | 14.4       | 17.3 | 19.2 |        |
| VRC-6E                  | 480* Three Phase | 14.4     | 13   |      |        | 19.2       | 23.0 |      |        |
| VRC-6E                  | 208 Single Phase | 58       | 49   | 44   |        | 10.8       | 13.0 | 14.4 |        |
| VRC-6E                  | 240 Single Phase | 50       | 43   | 39   |        | 14.4       | 17.3 | 19.2 |        |
| VRC-3E                  | 208 Three Phase  |          | 25   |      | 19     |            |      | 14.4 | 19.2   |
| VRC-3E                  | 240 Three Phase  |          |      | 22   |        |            |      | 19.2 |        |
| VRC-3E                  | 480* Three Phase |          |      | 10.8 |        |            |      | 77   |        |
| VRC-3E                  | 208 Single Phase |          |      | 44   | 33     |            |      | 14.4 | 19.2   |
| VRC-3E                  | 240 Single Phase |          |      | 38   |        |            |      | 19.2 |        |

\* The voltage applied to the unit is 480, but the elements are wired so each operates on 277VAC

## 4.2 VRC Checkout

1. Apply power to the VRC. On the back of the front-panel control board, flip the left DIPswitch up to start the diagnostics.
2. The red 7-segment display on the front panel should have some of its segments lit. If they are not then check the fuse and circuit breaker on the control transformer. Then check that all harnesses are in place and that the connectors are properly seated. Check for 24 VAC at the secondary of the control transformer.
3. Turn the knob so that the red display shows A1 (Analog 1 – RTD temperature). The green display should show the approximate temperature of the RTD probe in the cavity. If it shows a very small number or zero then the harness connecting the RTD to the control board is probably shorted to ground. If the number is very large – around 250 or more – it means the RTD or its harness is open or disconnected.
4. Turn the knob to A4 (Analog 4 – Line voltage). The green display should show the approximate line voltage.
5. Turn the knob to b (button). Push each button. The light near the button should light. Also, check that pushing the top two buttons makes the bottom two lights go out.
6. Turn the knob to P (Product code). The green display should show 001 for a standard VRC or 003 for an auto-fill VRC. If any other number is displayed the ribbon cable connecting the front-panel control board to the relay board is incorrect.
7. Turn the knob to S (Sensors). As each sensor is activated the associated green bar will light. If it doesn't then that sensor or harness connection is faulty. Refer to this diagram:



8. Lift the hi float and hold it up. The Hi Float bar should light after a few seconds. Release the float.
9. Lift the lo float and hold it up. The Lo Float bar should light after a few seconds. Release the float.
10. Close and open the door. The Door Open bar should go out when the door is closed. Use a magnet to check the door switch on the other side. The bar should go out when the magnet is near the door sensor.
11. Push the ON end of the rocker switch. The Power bar should light. Push the OFF end of the switch. The bar should go out.
12. On the left side of the VRC, under the heater plate at the front, disconnect one of the terminals on the thermostat closest to the front panel. The Overtemp bar (the one in the middle of the display) should light. If the Heater Overtemp bar (the top one) lights then the wiring to the two thermostats is probably crossed. Reconnect the terminal. The Overtemp (middle) bar should go out.
13. Disconnect one of the terminals on the thermostat farthest from the front panel. The Heater Overtemp (top) bar should light.

Reconnect the terminal. The Heater Overtemp (top) bar should go out.

14. Turn the knob to 01 (Output 1 - Shutdown). Push the ON (upper) end of the rocker switch. The large contactor closest to the back panel should pull in. Push the MANUAL button. The contactor should drop out.
15. If the VRC is equipped with auto-fill turn the knob to 02 (Output 2 – Fill valve). Push the MANUAL button a few times. The fill valve should open whenever the button is pushed.
16. Turn the knob to 06 (Output 6 - Heater). Push the ON end of the rocker switch. Lift the lower float all the way up and hold it up. Push the MANUAL button a few times. The large contactor closest to the front panel should pull in whenever the button is pushed. Check for proper line current on all three phases when the button is pushed. Note: For the heater to turn on the power must be on, the lower float must be up, and the overtemp thermostat must be operating properly.
17. Turn the knob to 07 (Output 7 – Fan). Push the MANUAL button. The fan should run.
18. Turn the knob to 08 (Output 8 – Beeper). Push the MANUAL button. The beeper should beep.
19. Turn the knob to 88. All lights and all display segments should light.
20. On the back of the front-panel control board, flip the left DIP-switch down to start normal VRC operation. The red heartbeat LED on the back of the control board should blink about once a second.
21. Perform the normal VRC checkout (add water, check steam production, etc.).

### Diagnostic Switch Summary

|                                         |                                            |
|-----------------------------------------|--------------------------------------------|
| A1 Analog 1 – RTD temperature           | 01 Output 1 – Shutdown                     |
| A2 Analog 2 – RTD millivolts            | 02 Output 2 – Fill valve                   |
| A3 Analog 3 – Control board temperature | 03 Output 3 – Spray valve                  |
| A4 Analog 4 – Line voltage              | 04 Output 4 – Drain valve                  |
| b Button test                           | 05 Output 5 – Eductor valve                |
| P Product code                          | 06 Output 6 – Heater (ON and low float up) |
| S Sensor outputs                        | 07 Output 7 – Fan                          |
|                                         | 08 Output 8 – Beeper                       |
|                                         | 88 All lights on                           |

### Error Codes

|                                             |       |
|---------------------------------------------|-------|
| 1 Lo float changed state while hi float on  |       |
| 2 Hi float changed state while lo float off |       |
| 3 Cold fill to hi float time exceeded       | Fatal |
| 4 Hot refill to hi float time exceeded      | Fatal |
| 5 Controller temperature exceeded           | Fatal |
| 6 Cavity temperature exceeded               | Fatal |
| 7 Drain box temperature exceeded            | Fatal |
| 8 Drain time exceeded                       |       |
| 9 RTD is open                               | Fatal |
| 10 RTD is shorted                           | Fatal |
| 11 Control board is too hot                 | Fatal |
| 99 No product code in connecting cable      | Fatal |

## WARNING

**Be sure the steamer is disconnected from the branch circuit power before performing any repair work.**

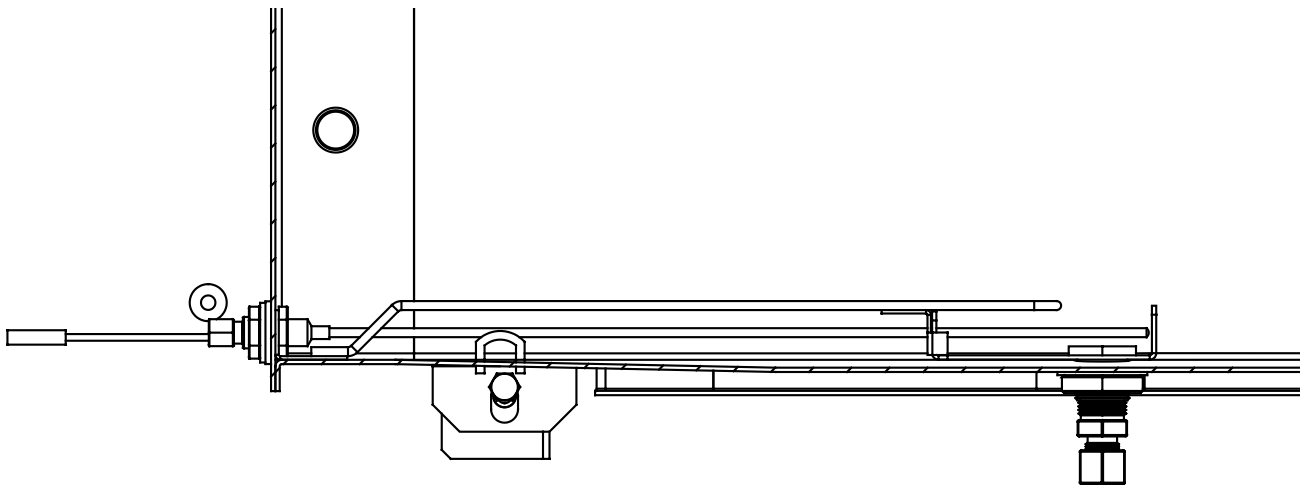
### 5.1 Air Temperature Probe

#### Removal

1. Turn off the steamer power and disconnect the steamer from the branch circuit. **Note:** an incorrectly installed air temperature probe **MUST** be replaced. Trying to operate the steamer with a bent or crushed probe will result in improper steamer operation.
2. Check to make sure the air temperature probe is not bent or crushed and is installed through the opening in the probe mounting bracket. There must be a 1/8" to 1/4" air gap between the probe tip and the probe mounting bracket. If the probe is bent, it must be replaced. If the probe tip location is not within the 1/8" to 1/4" air gap required, remove the air probe and correctly re-install it.
3. Remove the right and left covers from the steamer.
4. Disconnect the air temperature probe electrical leads from the probe harness.
5. Loosen the probe compression nut.
6. Remove the air temperature probe. Note: Slide probe through hole in rear cover to remove. If the male fitting was removed with the probe and compression nut, remove it from the probe. The probe and compression nut are an assembly.

#### Installation

7. If the air probe guard is not in place, one will have to be installed. Order all of the component parts required using the illustration shown.
8. If a new guard assembly is being installed, install the guard assembly, air temperature probe fitting, fiber washer, stainless steel washer, and nut as shown in the illustration.
9. Install the new air probe and compression nut assembly. Be careful not to bend the probe as you insert it through the steamer wall and on through both ends of the mounting bracket.
10. Connect the probe wires to the harness.
11. Replace the back, left and right covers.
12. Connect the steamer to the branch circuit.
13. Turn on the steamer power and test the steamer.



## 5.2 Cavity Vent Assembly P/N 140867 - Pressure Relief Valve

### Removal

1. Turn off the steamer power and disconnect the steamer from the branch circuit.
2. Remove the left side panel.
3. Loosen the two (2) hose clamps.
4. Remove the hose from the hose fittings.
5. Unscrew the assembly from the nipple attached to the cavity.

### Installation

6. Thread the new assembly onto the nipple attached to the cavity.
7. Replace the hose and hose clamps.
8. Replace the left side panel.

## 5.3 Control PC Board P/N 160648

### Removal

1. Turn off the steamer power and disconnect the steamer from the branch circuit.
2. Remove knob.
3. Unplug all the connectors attached to the control board.
4. Using a 5/16" socket, remove the 6/32 lock nuts and remove the board from the five studs on the front panel.

### Installation

5. Position the control board on the five studs.
6. Install the 6/32 lock nuts onto the studs. Use a 5/16" socket to tighten them in place.
7. Plug in connectors. Press firmly to make sure connectors are firmly seated.
8. Replace knob
9. Re-connect the branch circuit power supply.
10. Run complete diagnostics to test the steamer.

## 5.4 Relay Board P/N 160649

### Removal

1. Turn off the steamer power and disconnect the steamer from the branch circuit.
2. Unplug all the connectors attached to the relay board.
3. Using a 5/16" socket, remove the 6/32 lock nuts and remove the board from the four studs on the high voltage panel.

### Installation

4. Position the control board on the four studs.
5. Install the 6/32 lock nuts onto the studs. Use a 5/16" socket to tighten them in place.
6. Plug in connectors. Press firmly to make sure connectors are firmly seated.
7. Re-connect the branch circuit power supply.
8. Run complete diagnostics to test the steamer.

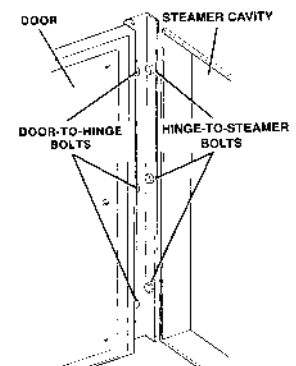
## 5.4 Door Removal/Installation/Alignment P/N 130858 Door Assembly for VRC-3E P/N 140749 Door Assembly for VRC-6E

### Removal

1. Turn the steamer off and allow it to cool.
2. Remove the door by supporting its weight and removing the hinge pin.
3. Place the door on a flat surface gasket facing up. Be sure not to scratch the door surface.
4. Inspect the door gasket for signs of cuts or other defects that may impair its function. Replace if necessary.

### Installation

5. To install the door, apply NEVER-Seez lubricant to the hinge pin. Align the door with the hinge and insert the pin. Apply serviceable Loctite 242 to the door-to-hinge bolts, and then install the door and mounting bolts. Do not tighten the mounting bolts at this time.



### Alignment

6. Place a piece of masking tape over the door pinhole in the door channel.
7. Close the door until the door pin just penetrates the masking tape.
8. If the door pin does not strike the center of the masking tape, loosen the hinge-to-steam bolts and align the door to the door pin. Tighten the hinge-to-steam mounting bolts.
9. You should be able to pull a dollar bill or comparable piece of paper smoothly between the gasket and the steamer cavity with the door closed. To adjust the hinge side, loosen the door-to-hinge bolts and align the door gasket with the steamer cavity. Tighten the door-to-hinge mounting bolts. To adjust the door bullet side see page 5-14.
10. Turn the steamer on and check for leaks.

## 5.5 Door Switch - P/N 096857

### Removal

1. Turn off the steamer power and disconnect the steamer from the branch circuit.
2. Remove the right side cover from the steamer.
3. Disconnect the door switch harness from the control board.
4. The switch is held in place by two slotted screws. Removing these two screws will allow the removal of the switch.
5. If the door has been reversed, remove the left side cover and follow the instructions above.

### Installation

6. Secure the new switch with the two slotted screws.
7. Plug in the door switch harness into the control board.
8. Replace the side cover.
9. Reconnect the branch circuit power supply.
10. Turn on the steamer and test for proper operation.

## 5.6 Door Reversing Procedure

1. Turn off the power to the steamer.
2. Support the door while removing the hinge-to-steamer bolts.
3. Place the door, with the hinge on a flat clean table, and the gasket face up.
4. Note the distance between the lock nut and the end of the door-locking pin (bullet). This information will be needed later on in step 6.
5. Loosen the lock nut, and then remove the door bullet and lock nut.
6. Coat the bullet threads with a few drops of Loctite 242. Install the bullet and lock nut directly across the steamer cavity from the old bullet location. Install these two items so that the lock nut to end of the bullet distance is approximately the same as measured in step 4.
7. Remove the two screws from above and below the old bullet location and install them above and below the new bullet location.
8. Remove the screws and U-channel from the door. Take the magnet and block assembly from the present location and place it at the opposite end of the door channel, with the magnet facing outward from the door.
9. Remove the two screws holding the door handle and cam.
10. Apply NEVER-SEEZ high temperature (1800 degree F) anti-seize and lubrication compound to the cam and a few drops of Loctite 242 to the door handle screw threads.

11. Turn the handle and cam 180-degrees from their original position and install them on the door with the screws. Be sure the handle and can move smoothly.
12. Be sure the door handle and door cam are in the DOWN position. Turn the U-channel 180-degrees from its original position, hold the door spring in the U-channel open with a screw driver or similar tool, and install the U-channel being sure the door spring is seated over the cam.
13. Check the operation of the cam. Push UP on the door handle and check if the spring opens. If the spring does not open, the cam and spring are NOT correctly aligned and the problem must be corrected.
14. Apply a light amount of Loctite 242 to the screws, then install them to hold the U-channel in place.
15. Apply Loctite 242 to the hinge-to-steamer bolts, and then install the door and hinge mounting bolts. Do NOT tighten the mounting bolts at this time.
16. Align the door to the steamer as described in the "Alignment Procedure".
17. Replace the right side cover.
18. Turn on the power to the steamer.
19. Close the steamer door and operate the steamer. If the fan does not operate, check the location of the door magnet and be sure the alternative door switch was connected.
23. With the door closed and the steamer in the MANUAL position, or the timer running, the READY light should come on in 15 to 20 minutes.
24. Once the steamer is up to READY check for leaks. If there are no leaks then the steamer is ready for operation. If there are leaks, recheck the door alignment and gasket installation.

## 5.7 Door Gasket

**P/N 124849 VRC-3E**

**P/N 140748 VRC-6E**

### Removal

1. Turn off the steamer and allow to cool.
2. Remove the door following the procedure for "Door Removal".
3. Position the door on a clean flat surface.
4. Remove the inner door panel, using a flat blade screwdriver, and remove the screws.
5. Remove and discard the old gasket.
6. Clean the back of the inner door panel and remove all of the old sealant.

## Installation

7. Apply a RTV 732 or equivalent, to the door spacers.
8. Install the new door gasket around the outer door panel on the insulation board. Be sure the inner door panel flange is fully inserted into the gasket groove.
9. Apply Locktite 242 to the threads of the inner door mounting screws and tighten.
10. Align the door with the hinge and insert the pin or apply Locktite 242 to the door-to-hinge bolts, then install the door and mounting bolts. Refer to the section on "Door Alignment".

## 5.8 Door Spring - P/N078911

### Removal

1. Turn the steamer off and allow it to cool.
2. With a flat blade screwdriver, remove the two 8-32 truss head screws on the door U-channel. Remove the U-channel from the door.
3. Carefully remove the retaining ring from one end of the spring support pin, and then remove the pin by moving the pin to the left or to the right,
4. With a 3/8" nut driver, remove the 10-32-kep nut, lift the square plate, then remove the spring.

### Installation

5. Apply a high temperature anti-seize lubrication (Never-Seez Apply Locktite 242 to the kep nut and install the kep nut.) on the bottom of the U-channel surface that contacts the spring.
6. Install the spring onto the brass roller, and then place the square plate over the spring.
7. Apply Locktite 242 to the kep nut and install the kep nut.
8. Install the spring support pin, and then push the retaining ring onto the pin, using a screwdriver.
9. Hold the door spring open with a screwdriver or similar tool, hold the door handle in the down position and install the U-channel, top end first, and then lower the channel into position. Check that the spring opens when the door handle is pushed up.
10. Apply Locktite 242 to the U-channel mounting screws and install the screws.

## 5.9 Door Locking Pin

P/N 078914 Door Locking Pin

P/N 003823 Lock Nut

### Removal

1. Turn off the steamer and allow it to cool.
2. Note and record the distance between the lock nut and the door pin (bullet) from the front panel.
3. Loosen the lock nut and remove it and the door pin from the front panel.

### Installation

4. To install the door locking pin, coat the threads with a few drops of Locktite 222.
5. Install the door locking pin with the lock nut to the front panel. The lock nut to the end-of-the bullet distance should be approximately the same as measured above, in step 2.
6. The position of the bullet should be such as to firmly retain the door when closed.
7. The frictional force should be adjusted by turning the door locking pin in or out accordingly.
8. The pressure should be such that a dollar bill or similar piece of paper, when pulled out from between the door gasket and the steamer cavity, requires some effort.
9. Tighten the lock nut down after the door tightness is checked.

## 5.10 Drain Valve Assembly

**WARNING**  
**Be sure to drain all of the water out of the water reservoir.**

### Removal

1. Turn off the branch circuit power to the steamer.
2. Remove the left side cover from the steamer.
3. Disconnect the drain actuator shaft from the drain connection bracket, by removing the 3/8" hex nut.
4. Disconnect the drain connection bracket from the drain valve by disconnecting the 1/4" hex nut from the valve stem.
5. Remove the drain valve by unthreading off the pipe nipple.
6. Remove the pipe extension from the drain valve.

## Installation

7. Attach the pipe extension to the drain valve.
8. Attach the drain valve to the pipe nipple attached to the cavity.
9. Attach the connection bracket to the drain valve body, using the 1/4" hex nut.
10. Attach the drain actuator shaft to the connection bracket, using the 3/8" hex nut.
11. Fill the steamer water reservoir with water and check for leaks.
12. Re-connect the steamer to the branch circuit power supply.
13. Turn on the steamer and check for proper operation.

## 5.11 Fan - P/N 096790

### Removal

1. Turn the steamer off and disconnected from the branch circuit power, and open the door to allow it to cool before proceeding.
2. Remove the support rack from in front of the fan.
3. With a 1/8" Allen wrench, loosen the setscrew that holds the fan to the motor shaft.
4. Hold the fan and with a slight rocking motion, pull the fan off the motor shaft.

### Installation

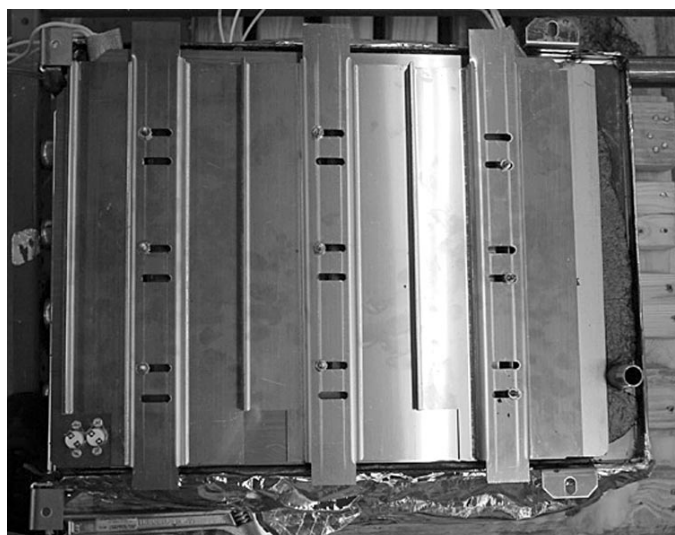
5. Position the fan hub on the motor shaft so that the 1/8" Allen set screw is over the flat on the motor shaft.
6. Slide the fan onto the motor shaft so that the motor shaft is flush with the fan hub.
7. With a 1/8" Allen wrench, tighten the setscrew on the fan.
8. Install the support rack and check for any interference between the fan and the support rack.
9. Turn the branch circuit power on, and turn the steamer on.

## 5.12 Heater Element

|            |           |         |        |
|------------|-----------|---------|--------|
| P/N 142499 | 208 Volts | 12 KW   | VRC-6E |
| P/N 142355 | 240 Volts | 12 KW   | VRC-6E |
| P/N 142500 | 480 Volts | 12 KW   | VRC-6E |
| P/N 150458 | 208 Volts | 10 KW   | VRC-6E |
| P/N 150459 | 240 Volts | 10 KW   | VRC-6E |
| P/N 160348 | 480 Volts | 10 KW   | VRC-6E |
| P/N 142355 | 208 Volts | 9 KW    | VRC-6E |
| P/N 142500 | 240 Volts | 9 KW    | VRC-6E |
| P/N 141075 | 208 Volts | 9 KW    | VRC-3E |
| P/N 141079 | 240 Volts | 9 KW    | VRC-3E |
| P/N 141080 | 480 Volts | 9 KW    | VRC-3E |
| P/N 141079 | 208 Volts | 6.76 KW | VRC-3E |

## Removal

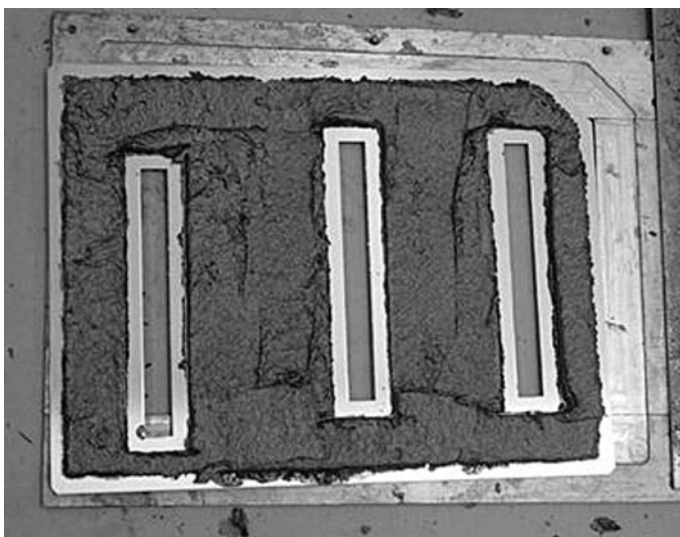
1. Remove all power connections, drains lines, and fill lines (if applicable). A stacked unit must be removed from its location (top or bottom) in order to change the element.
2. Disconnect the element wires connected to the terminal block.
3. Due to the location of the element and the limited space available, you must turn the unit upside down.
4. Remove the two side panels.
5. Remove the base of the unit. The base is held in 4 places attached to the legs.
6. Remove drain lever. This can be done by removing the nut on the coupling at the valve.
7. Remove the plate support.
8. Remove all the insulation and holding brackets.
9. Remove the press plate and the lower heat sink plate.



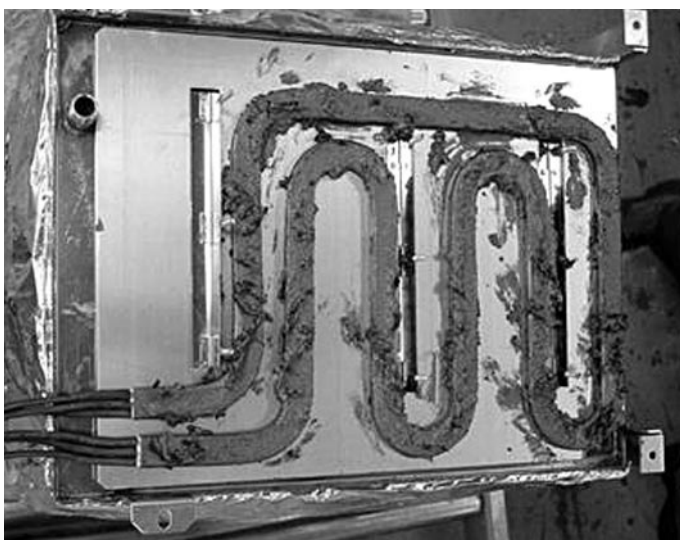
10. Remove element and the upper heat sink plate.
11. Once the upper plate is removed, scrape away ALL the Thermal Paste material from the bottom of the cavity. In order to do this effectively, use a putty knife.

## Installation

12. Assemble the plate assembly DRY to be sure the orientation of the assembly is correct and the correct sides of the plates are marked. There is not enough paste supplied with the kit to do the assembly twice. Disassemble to apply the Thermal Paste.
13. Apply the Thermal Paste evenly to the bottom of the cavity or top of upper aluminum heat sink plate. See the figure on page 5-17. Thickness should be about 1/4" inch. Place the upper heat sink plate in place on the bottom of the cavity.



14. Spread the Thermal Paste over both sides of the element. It is easiest if disposable gloves are used.
15. Carefully place the element on the upper aluminum plate. Ensure correct orientation of the element.



16. Place the lower aluminum heat sink plate on the element. This plate has orientation studs. Carefully adjust the element so the orientation studs do not sit on the element. Shortened element life will result.
17. Place the press plate on the lower heat sink plate.
18. Re-install the support brackets and insulation.
19. Enclose the assembly with the plate support cover.
20. Reinsert the drain lever and check for orientation.
21. Wire elements per wiring diagram. Note: 6-pan 480v 3 phased must be wired in a Y-configuration.

## 5.13 Hi-limit Thermostat - P/N 141661

The thermostat is attached to the heating element press plate (143037) and is held on with two 6-32 x 3/8" long screws.

### Removal

1. Turn off the steamer power and disconnect the steamer from the branch circuit.
2. Unplug the two wires from the thermostat to the wiring harness.
3. Using a short flat blade screwdriver, remove the two 6-32 screws holding the thermostat to the heater support bracket.

### Installation

4. Seat the thermostat on the heater support bracket and fasten with the two screws.
5. Plug the two wires from the thermostat into the wiring harness.

## 5.14 Leg Assemblies - P/N 43121

The leg assemblies are screwed into weld nuts attached to the base assembly.

### Removal

1. Turn off the steamer power and disconnect the steamer from the branch circuit.
2. Raise the steamer up and support the weight of the steamer
3. Unscrew the leg assembly

### Installation

4. Line up the threaded stud on the leg assembly with the weld nut attached to the base, and screw the leg in until tight
5. Lower the steamer onto all four legs
6. Check the level of the steamer

## 5.15 Fan Motor Assembly

P/N 096740 Fan Motor

P/N 096868 Motor Shaft Seal

P/N 096831 Oil Slinger Washer

### Removal

1. Turn off the steamer power and disconnect the steamer from the branch circuit.
2. Remove the support rack from in front of the fan.
3. With a 1/8" Allen wrench, loosen the setscrew that holds the fan to the motor shaft.
4. Hold the fan and with a slight rocking motion, pull the fan off the motor shaft.
5. Disconnect motor harness from Relay Board and motor capacitor.
6. Using a 7/16" nut driver, remove the four 1/4"-20 kep nuts holding the motor. Note that one of the nuts secures the motor ground strap to the steamer.
7. Remove the motor mounting plate to which the motor is attached.

### Installation

8. Make sure the motor insulation is installed on the four threaded studs to the cavity wall.
9. Apply lubrication on both sides of the steamer motor seal and inside the hole.
10. Insert the steamer motor seal in the cutout of the insulator board.
11. Slide the oil slinger washer onto the motor shaft, about 1/2" down the shaft.

### IMPORTANT

**The oil slinger washer has a rubber surface and a phenolic surface. Make sure the phenolic surface is facing the motor.**

12. Install the seal holder plate onto the motor shaft. Carefully slide the seal holder plate on the motor shaft until it engages the oil slinger washer. Continue sliding the plate on the motor shaft until it rests on the raised bosses of the motor casing.
13. The rubber surface on the oil slinger washer should be in contact with the seal holder plate and there should be approximately 1/16" gap between the phenolic surface and the motor.
14. Attach the motor mounting plate to the motor with the 6-32 screws.
15. The entire assembly can now be positioned on the four mounting studs protruding from the cavity wall. Tighten the motor assembly with the 1/4" kep nuts using a 7/16" nut driver. Make sure the green ground strap is fastened by one of the kep nuts securing the motor.
16. Reconnect motor harness to relay board and motor capacitor.

## 5.16 Motor Starting Capacitor - P/N096813

### Removal

1. Turn off the steamer power and disconnect the steamer from the branch circuit.
2. Loosen the screw holding the motor capacitor.
3. Unplug the two wires from the capacitor. Remove the capacitor.

### Installation

4. Install and tighten the screw holding the capacitor to the mounting plate.
5. Plug in the terminal wires to the capacitor,
6. Re-connect the branch circuit power and test the steamer for proper operation.

## 5.17 Back Panel

**P/N 140444 Back Panel VRC-3E**

**P/N 140764 Back Panel VRC-6E**

### Removal

1. Turn off the steamer power and disconnect the steamer from the branch circuit.
2. Remove the right, left and top panels (as described in Items 5).
3. Then remove the single 10-32 screw holding the cavity vent to the back panel and the two screws at the bottom of the panel.
4. Support the electrical control assembly that is attached to the back panel.
5. Unit w/autofill remove fill & drain hoses

### Installation

6. Hold the back panel in-place and replace the two 10-32 screws on the bottom edge of the panel.
7. Re-attach the cavity vent assembly with the single 10-32 screw.
8. Units w/ autofill re-attach fill and drain hoses
9. Replace the top, left and right side panels.
10. Turn on the electrical power the steamer.

## 5.18 Right Side Panel and Left Side Panel

**P/N 140447 Right Side Panel VRC-3E**

**P/N 140448 Left Side Panel VRC-3E**

**P/N 140761 Right Side Panel VRC-6E**

**P/N 140762 Left Side Panel VRC-6E**

### Removal

1. Turn off the steamer power and disconnect the steamer from the branch circuit.
2. With a flat blade screwdriver remove the three 10-32 screws, two on the bottom edge and one on the top edge. The panel is retained to the front edge of the steamer by a tongue and groove and by a spring-like clamp on the back and bottom edges.
3. Once the screws are removed slide the panel towards the front with a lifting motion. Do not attempt to pry the panel. Once the panel is free of the rear clips, the panel may be lifted off.

### Installation

4. When replacing the panel, press the rear edge inward so that all of the spring-like clip will be retain the rear flange.
5. Make sure that the holes in the panel are in alignment with the tapped holes in the steamer so that the replacement on the screws will be easy and not damage the screws.

## 5.19 Top Panel

**P/N 140760 Top Cover VRC-3E**

**P/N 123133 Top Cover VRC-6E**

### Removal

1. Turn off the steamer power and disconnect the steamer from the branch circuit.
2. First remove the right and left side panels (as described in item 5).
3. Remove the retaining bracket, which prevents the top from sliding forward.
4. Slide the cover forward, and once clear of the spring-like clips on the back and the front flange, the cover may be lifted off.

### Installation

5. Hold down the center rear to engage the sprig-like clips and slid the cover over the front flange.
6. Replace the two retaining brackets.

## 5.20 Remote Reading Thermometer P/N 141055 Remote Reading Thermometer

### Removal

1. Turn off the steamer power and disconnect the steamer from the branch circuit.
2. Remove the left and right side panels.
3. On the left side, remove the 5/8" compression hex nut holding the capillary bulb in place.
4. Push the capillary bulb out from the inside of the cavity.
5. Disconnect capillary tube from cable support bracket.
6. With a small flat blade screw driver, remove the (3) pan head 6-32 x 3/8" long screw that holds the face of the thermometer to the front panel.
7. Pull the gauge and capillary out through the hole in the front panel.

### Installation

8. Pass the bulb, capillary and gauge through the opening in the front panel.
9. Fasten the gauge to the front panel with the (3) pan head 6-32 x 3/8" long screw that holds the face of the thermometer to the front panel.
10. Re-connect capillary to cable support bracket.
11. Tighten the compression nut to the bulb fitting.
12. Connect power and test operation, especially for leaks around the capillary bulb.

## 5.21 Water Level Float

### Removal

1. Turn off the steamer power and disconnect the steamer from the branch circuit.
2. Remove the right side cover from the steamer.
3. Disconnect the water level floats from the relay board.
4. Loosen and remove the hex locking nut and washer.
5. Remove the water level floats from inside the cavity.

### Installation

6. Insert the new water level floats through the opening from inside the steamer cavity (be sure the o-ring seal is in place). The lower float should pivot upward and the upper float should pivot downward.
7. From the back, put on the washer and locking nut and tighten to prevent any water leaks.
8. Attach the float wires to relay board.
9. Turn on the branch circuit power supply.
10. Turn on the steamer and test.

## 5.22 WATER DRAIN KIT INSTALLATION

### 1. Remove all parts from shipping cartons.

### 2. Check-identify all parts as follow.

#### 2.1 Water Drain Parts

|        |                            |   |
|--------|----------------------------|---|
| 142549 | Elbow 3/4 hose barb 90 deg | 1 |
| 142550 | Tee 3/4 hose barb          | 1 |
| 143246 | Drain assembly, autodrain  | 1 |
| 143250 | Hose long 3/4" ID x 10ft   | 1 |
| 143254 | Hose 3/8" ID x 30          |   |

### 3. Water drain installation steps.

3.1 The condensate drain line needs to be disconnected before the left side cabinet panel can be replaced.

3.1a From the bottom of the unit just right of the drain valve unscrew the condensate drip bracket.

3.1b From the inside, loosen the tension clamps and remove the bracket from the hose and the hose from the condensate line.

3.1c Slide the tension clamps off of the hose and use them on next step.

3.1d Install one end of the supplied hose 3/8" ID x 30" long on the condensate line where the condensate trap to drain hose were installed before, pull the other end of the hose through the hole where the bracket was mounted. Reinstall the inside tension clamp.

3.2 Guide the hose loose end thru the uncovered hole to the outside bottom of the unit as drawing shows.

3.3 Thread the hose drain assembly onto the unit drain valve, see drawing.

3.4 Connect the 3/8" diameter x 30" long hose loose end to the plastic barb fitting on the drain assembly and reuse the other tension hose clamps.

3.4a If you are installing a kit on a 3 pan model cut this 3/8" x 30" long hose to fit.

3.5 A 10ft piece of hose is supplied with this kit, it can be cut to length and used with the elbow to help route the hose to the proper drain location.

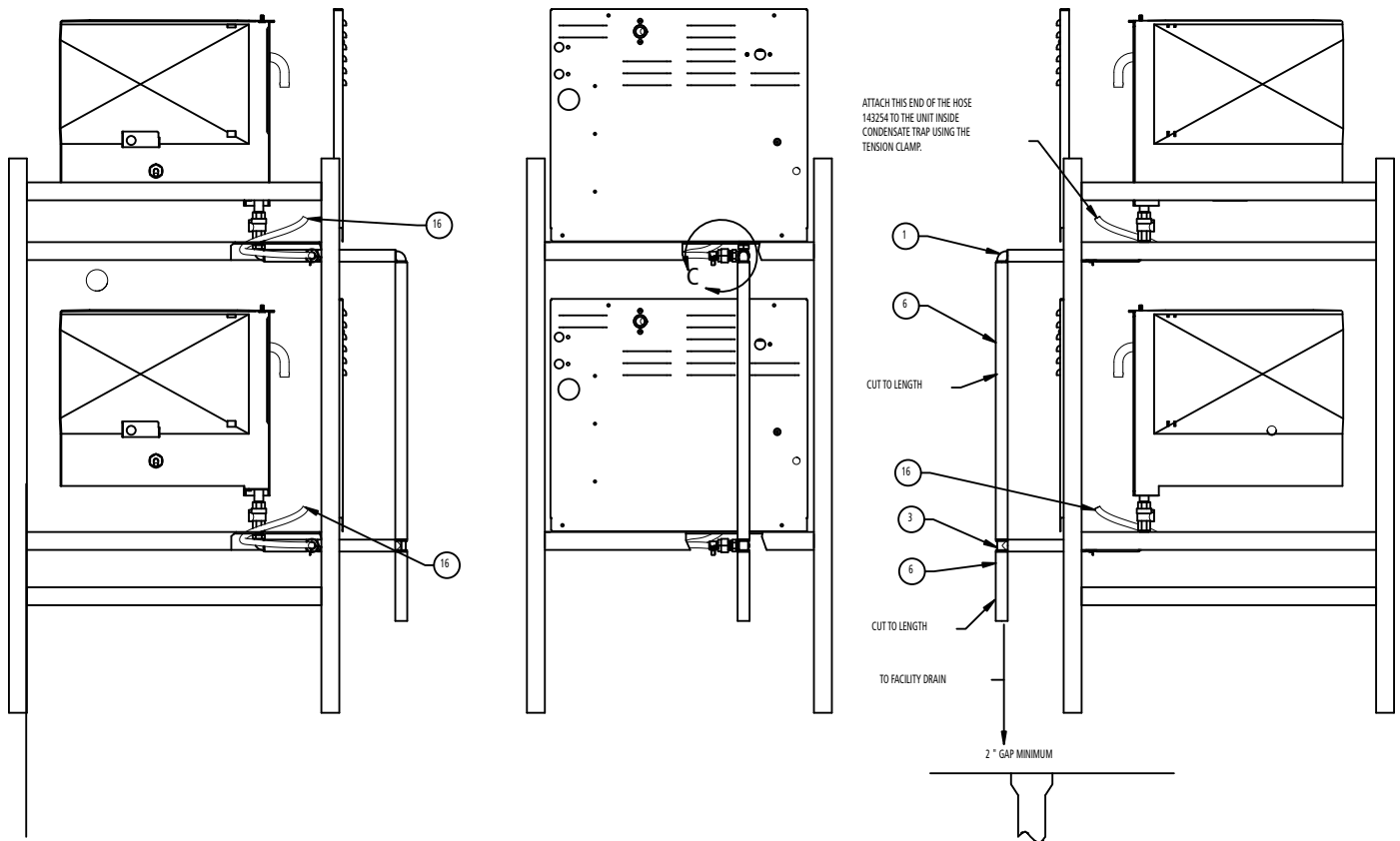
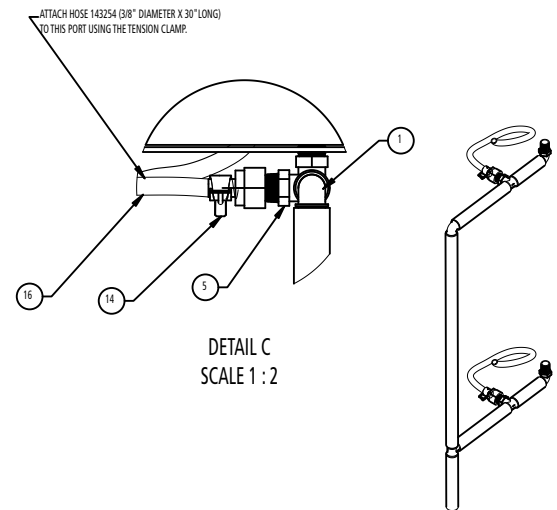
3.6 For single units cut the long hose to length as needed to route it to facility drain. Note hose end must have at least a 2" gap from the floor drain, do not use traps.

3.7 For double stack units, a 6.5" long piece of hose can be cut to join the upper and lower cavities by using the supplied tee on the bottom unit, the supplied elbow on the top unit and a piece to connect the two cavities as shown. Permit a 2" air gap from the floor drain. Do not use traps.

### 4. Test to ensure the final assembly of the drain line allows the water to flow freely.

Loops or kinks in the hose will cause back pressure which may cause the door to pop open during draining.

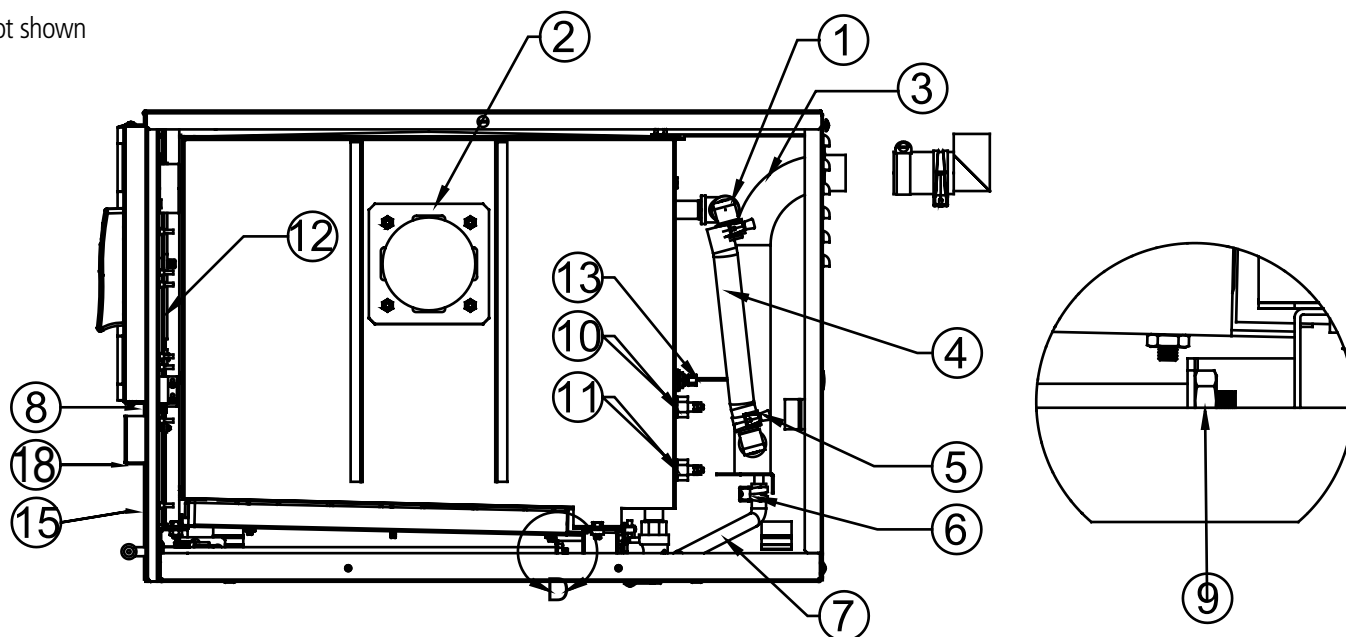
| Item # | Part # | Description                      |
|--------|--------|----------------------------------|
| 1      | 142549 | Elbow, 3/4" Hose Barb            |
| 2      | 141067 | Chamber Assembly. Reference only |
| 3      | 142550 | Tee, 3/4" Hose Barb              |
| 4      | 140789 | Back Panel - Reference Only.     |
| 5      | 143246 | Drain Assembly, Autodrain Kit    |
| 6      | 143250 | Hose, long 3/4" ID x 10 ft.      |
| 14     | 127523 | Hose Clamp                       |
| 16     | 127523 | Hose 3/8" ID X 30" Long          |



## 6.1 Cavity Vent Assembly

| No. | Description                                                               | Qty. | Part No. |
|-----|---------------------------------------------------------------------------|------|----------|
| 1*  | Pressure Relief Valve 1/2 PSI<br>(Remove used plug if needing to replace) | 1    | 140867   |
| 2   | Kit Motor Assembly                                                        | 1    | 146880S  |
| 3   | Exhaust Assembly                                                          | 1    | 141512   |
| 4   | Hose                                                                      | 1    | 142528   |
| 5   | Constant Tension Band                                                     | 2    | 127524   |
| 6   | Clamp, Constant Tension                                                   | 2    | 127523   |
| 7   | Condensate Hose 9"                                                        | 1    | 92124    |
| 8   | Rocker Switch                                                             |      | 160920   |
| 9   | Drain Actuator Shaft                                                      | 1    | 141074   |
| 10  | High Float                                                                | 1    | 149880   |
| 11  | Low Float                                                                 | 1    | 149880   |
| 12  | PC Control Board                                                          | 1    | 160648   |
| 13  | Air Temperature Probe                                                     | 1    | 085187   |
| 14* | Shaft Grip                                                                | 1    | 141668   |
| 15  | Remote Reading Dial Thermometer                                           | 1    | 141055   |
| 16* | Overlay (Front Panel Lower)                                               | 1    | 141070   |
| 17* | Overlay (Front Panel)                                                     | 1    | 160523   |
| 18  | Hour meter                                                                | 1    | 149295   |

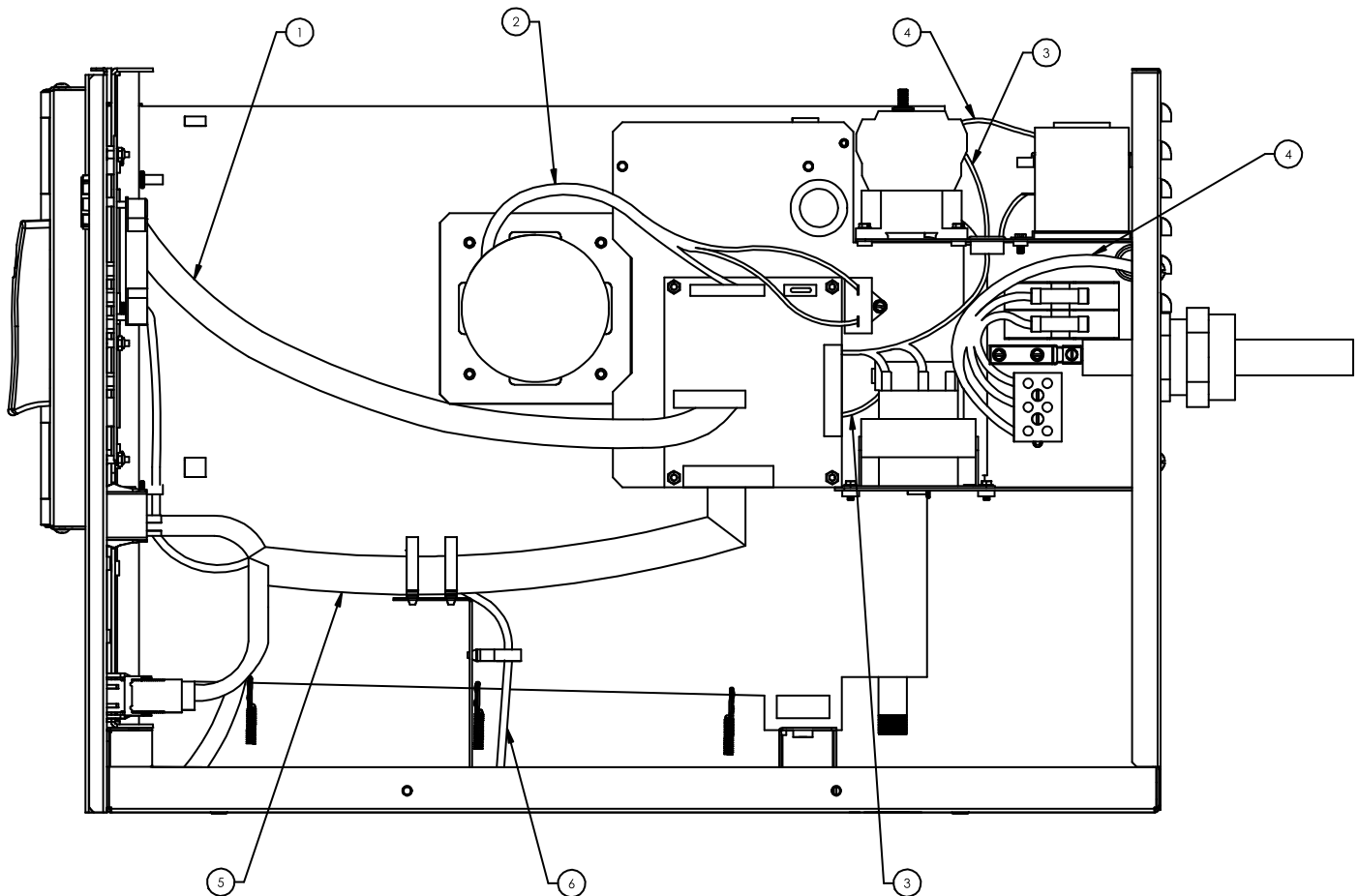
\*Not shown



## 6.2 Control Board and Wiring Harnesses

| No. | Description                         | Qty. | Part No. |
|-----|-------------------------------------|------|----------|
| 1   | Harness, VRC Control to Relay Board | 1    | 160879   |
| 2   | Motor 1/15HP 2-Pole                 | 1    | 096739   |
| 3   | Harness, VRC Low Voltage            | 1    | 160875   |
| 4   | Harness, Steamer High Voltage       | 1    | 160874   |
| 5   | Harness, VRC Forward                | 1    | 160876   |
| 6   | Harness, VRC RTD to Control Board   | 1    | 160878   |
| 7*  | Harness, VRC Auto-Fill              | 1    | 160877   |

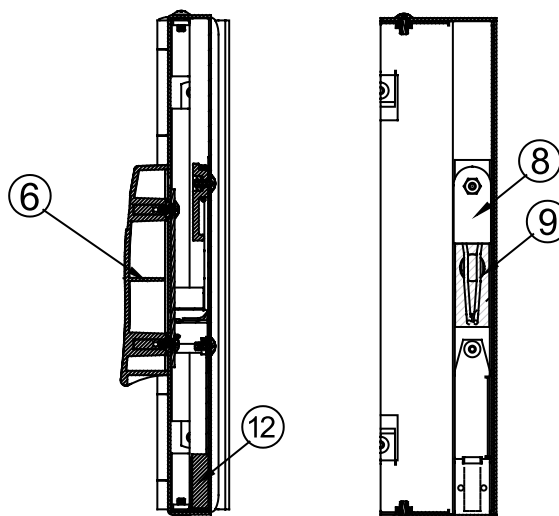
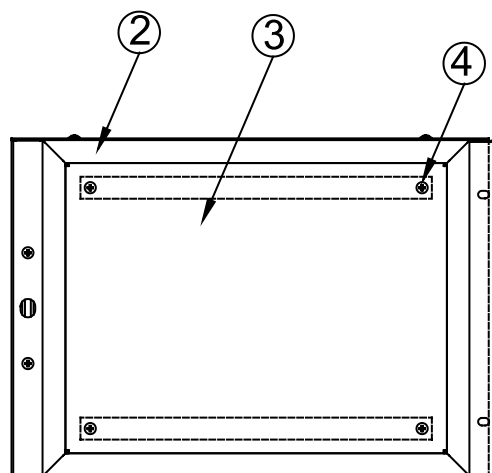
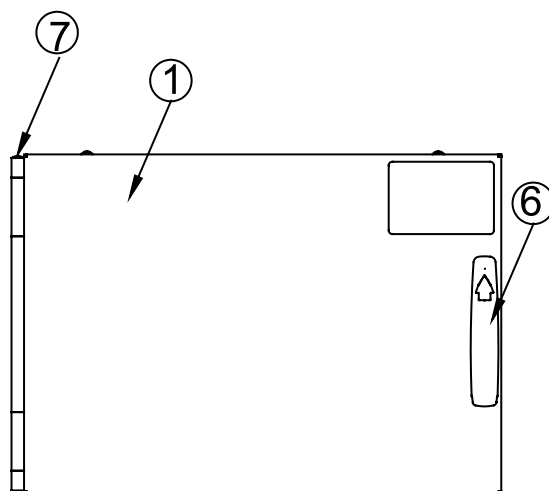
\*Not shown



## 6.3 Door Assembly (130858)

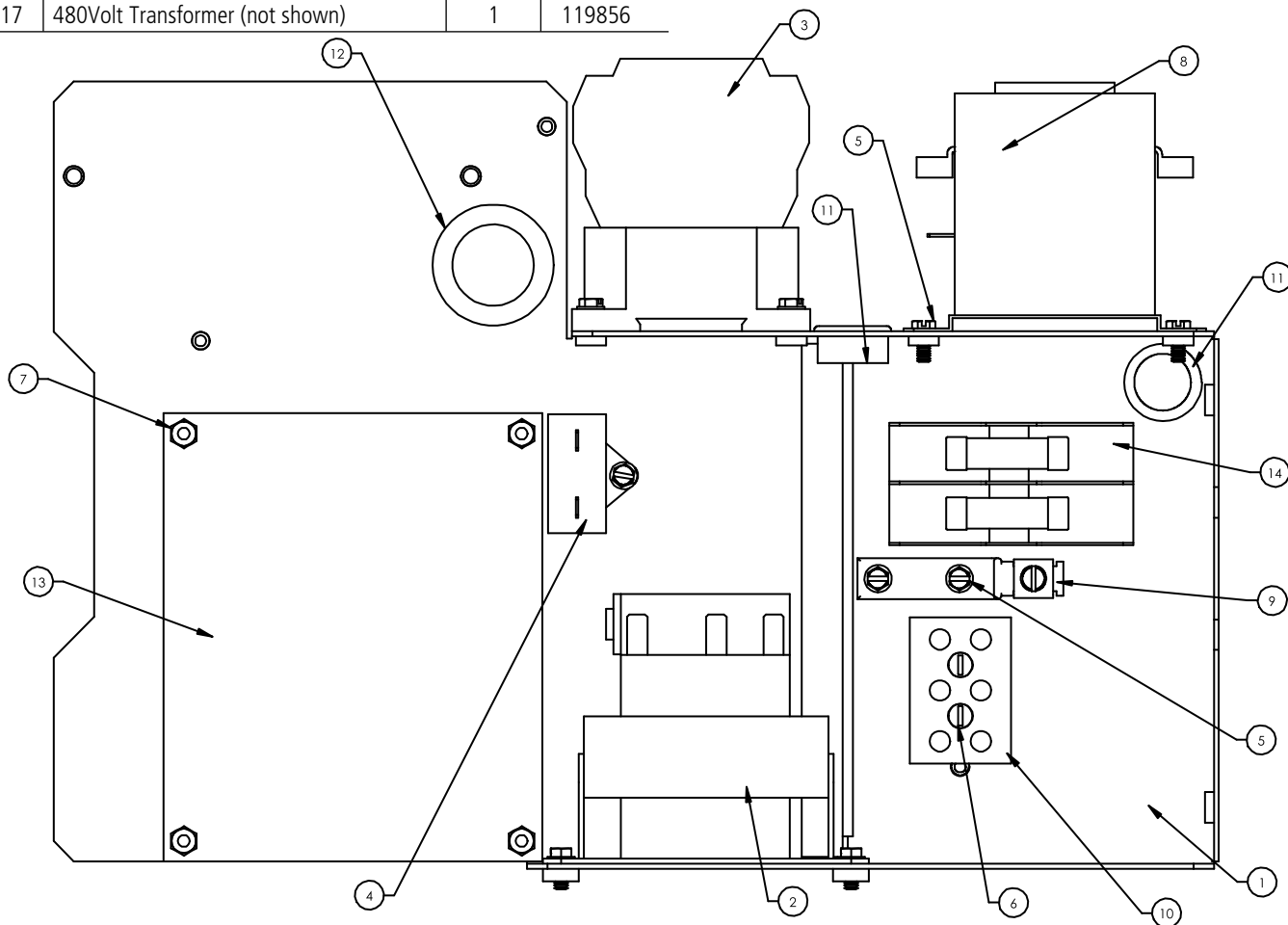
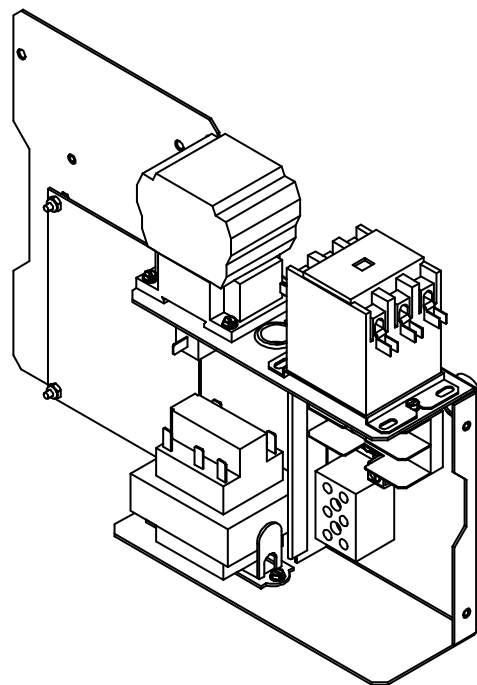
| No. | Description       | Qty. | Part No. |
|-----|-------------------|------|----------|
| 1   | Outer Door Panel  | 1    | 130895   |
| 2   | Gasket            | 1    | 124849   |
| 3   | Inner Door Panel  | 1    | 130861   |
| 4   | Truss Head Screws | 6    | 005764   |
| 5*  | Hex Head Screws   | 2    | 005608   |
| 6   | Door Handle       | 1    | 129723   |
| 7   | Door Hinge        | 1    | 140755   |
| 8   | Door Cam          | 1    | 074252   |
| 9   | Latch Assembly    | 1    | 140752   |
| 10* | Door Spacers      | 4    | 071206   |
| 11* | Insulator Board   | 1    | 140754   |
| 12  | Block and Magnet  | 1    | 069762   |

\*Not shown



## 6.4 Electrical Components 208/240/480 Volts

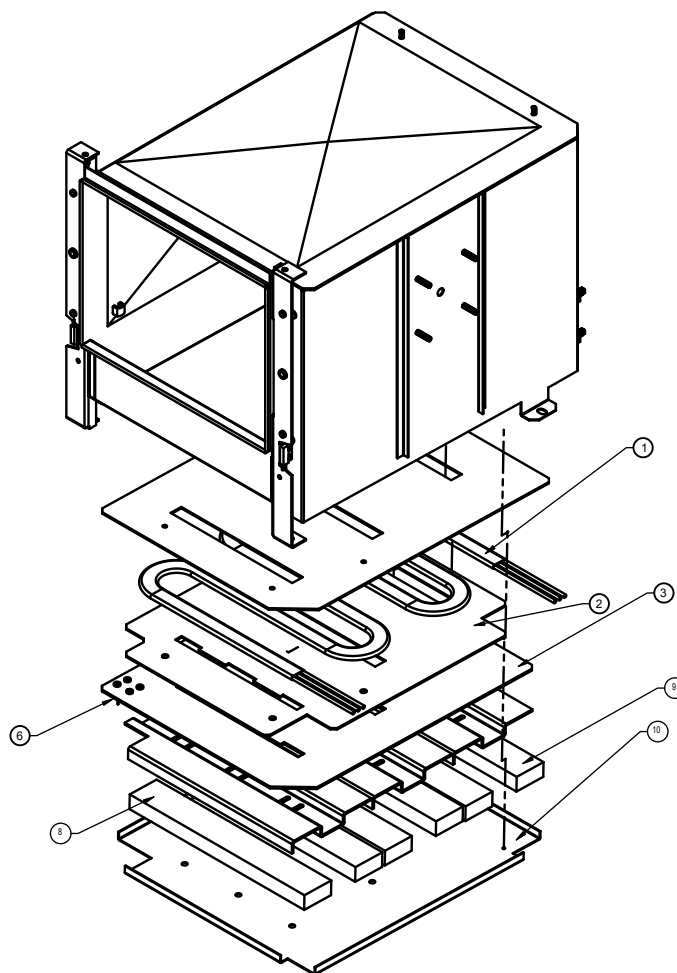
| No. | Description                               | Qty. | Part No. |
|-----|-------------------------------------------|------|----------|
| 1   | High Voltage Panel                        | 1    | 160488   |
| 2   | Transformer, 75VAC                        | 1    | 121716   |
| 3   | Contactor, 3-Pole                         | 1    | 144418   |
| 4   | Capacitor Foil 3 Mfd                      | 1    | 096813   |
| 5   | Screw Hex Slotted Washer Head Cap         | 11   | 069789   |
| 6   | Screw Round Head 8-32 1 1/4"              | 2    | 005056   |
| 7   | Nut Lock 6-32                             | 4    | 119855   |
| 8   | Contactor, 3-Pole 30Fla                   | 1    | 148102   |
| 9   | Mechanical Lug, Ground, #2-#8             | 1    | 106412   |
| 10  | Terminal Block 3-Pole                     | 1    | 003888   |
| 11  | Bushing Snap 11/16" I.D.                  | 2    | 012864   |
| 12  | Bushing Snap 1" I.D. x 1-3/8"             | 1    | 097015   |
| 13  | Relayboard, Steamer                       | 1    | 160649   |
| 14  | Fuse Block Assy                           | 1    | 160919   |
| 15  | Harness, VRC Low Voltage (not shown)      | 1    | 160875   |
| 16  | Harness, Steamer High Voltage (not shown) | 1    | 160874   |
| 17  | 480Volt Transformer (not shown)           | 1    | 119856   |



## 6.5 Heater Element Assembly

| No. | Description                                        | Qty.  | Part No. |
|-----|----------------------------------------------------|-------|----------|
| 1   | Heater Element Replacement Kit<br>208 volts 9 KW   | 1     | 143320   |
| 1   | Heater Element Replacement Kit<br>240 volts 9 KW   | 1     | 143321   |
| 1   | Heater Element Replacement Kit<br>480 volts 9 KW   | 1     | 143322   |
| 2   | Heater Support Bracket                             | 2     | 142558   |
| 3   | Heater Support Bracket<br>with Hi-limit Thermostat | 1     | 143037   |
| 4*  | Lock Washers, #10                                  | 6     | 005654   |
| 5*  | Hex Nuts 10-32                                     | 6     | 013613   |
| 6   | Hi-limit Thermostat                                | 2     | 141661   |
| 7*  | Round Head Screw<br>6-32 x 3/16"                   | 4     | 158599   |
| 11  | Heat Transfer Compound<br>Not Shown                | 40oz. | 143409   |
| 8   | Heater Insulation 13"                              | 1     | 142510   |
| 9   | Heater Insulation 15"                              | 1     | 142357   |
| 10  | Insulation Plate Support                           | 1     | 142551   |

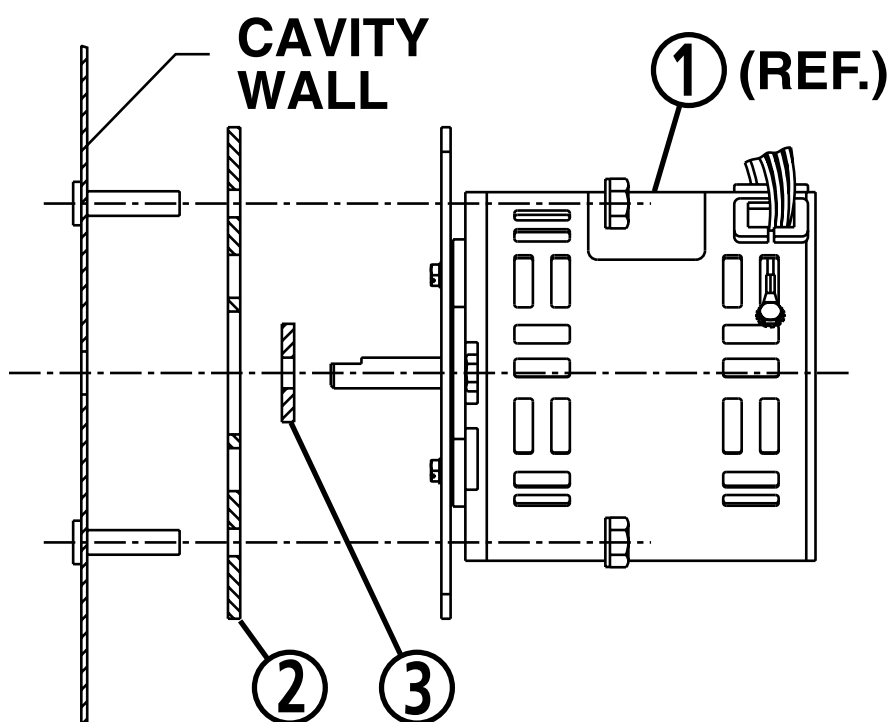
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## 6.6 Motor Assembly

| No. | Description          | Qty. | Part No. |
|-----|----------------------|------|----------|
| 1   | Motor Assembly (Kit) | 1    | 146880S  |
| 2   | Motor Insulator      | 1    | 094135   |
| 3   | Motor Shaft Seal     | 1    | 096868   |
| 4*  | Keps Nut 1/4" -20    | 4    | 012940   |
| 5*  | Blower Wheel (Fan)   | 1    | 096790   |
| 6*  | Set Screw            | 1    | 096789   |

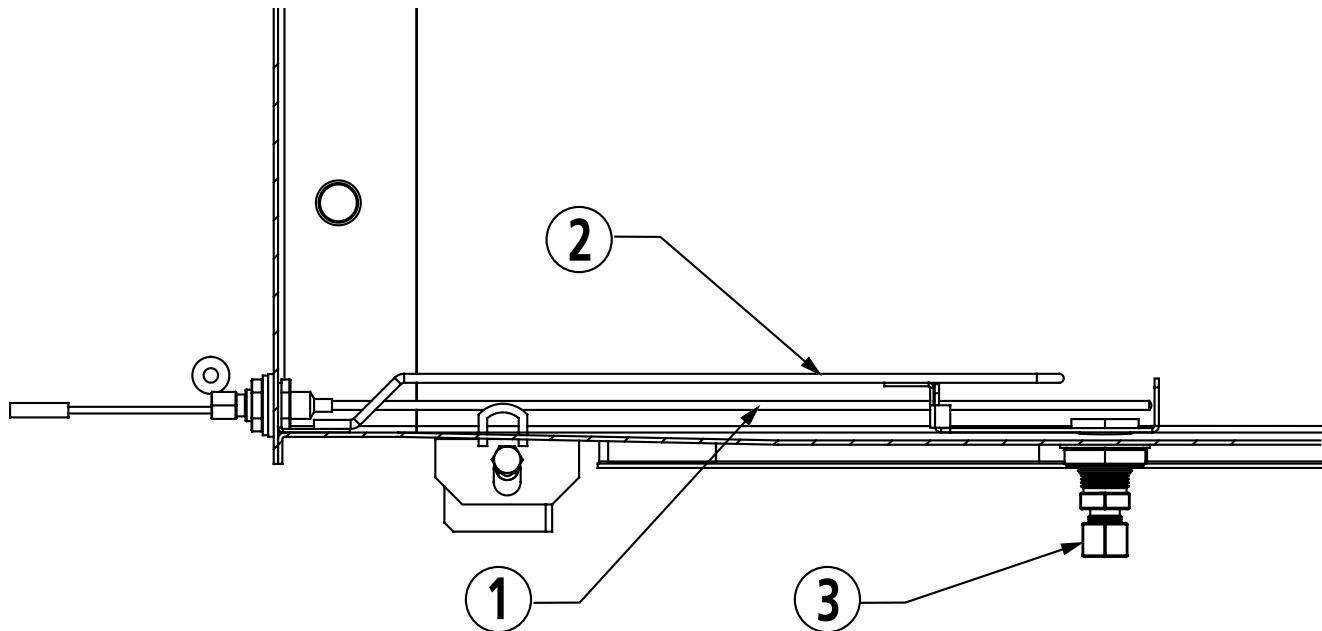
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## 6.7 Float Assemblies

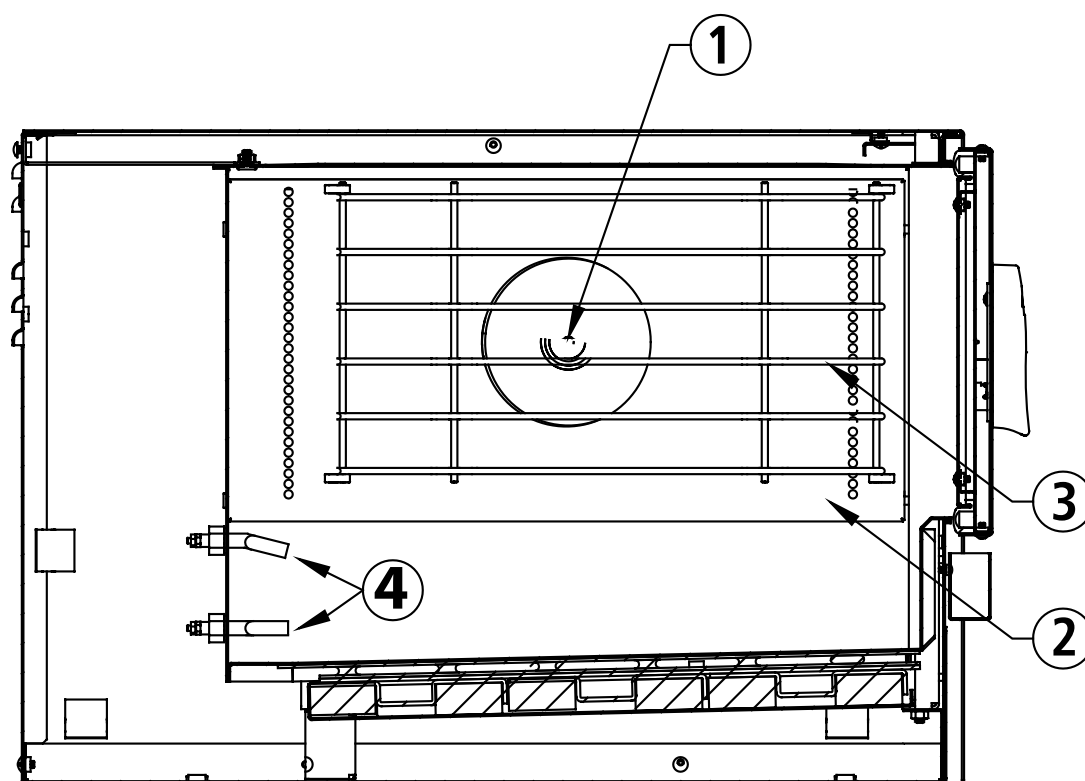
| No. | Description                    | Qty. | Part No. |
|-----|--------------------------------|------|----------|
| 1   | Cavity Air Temperature Probe   | 1    | 085187   |
| 2   | Probe Protector Assembly       | 1    | 074827   |
| 3   | Compression Nut 1/8"           | 1    | 071284   |
| 4*  | Probe Male Fitting             | 1    | 071217   |
| 5*  | Remote Reading Thermometer     | 1    | 141055   |
| 6*  | Temperature Gauge Bulb Fitting | 1    | 141058   |
| 7*  | Jam Nut 3/4 " -16              | 1    | 141056   |
| 8*  | Fiber Washer 3/4 "             | 1    | 141069   |
| 9*  | Flat Washer 3/4 " SS           | 1    | 114816   |
| 10* | Compression Fitting 3/8"       | 1    | 141057   |

\*Not shown



## 6.8 Interior and Exterior Cabinet

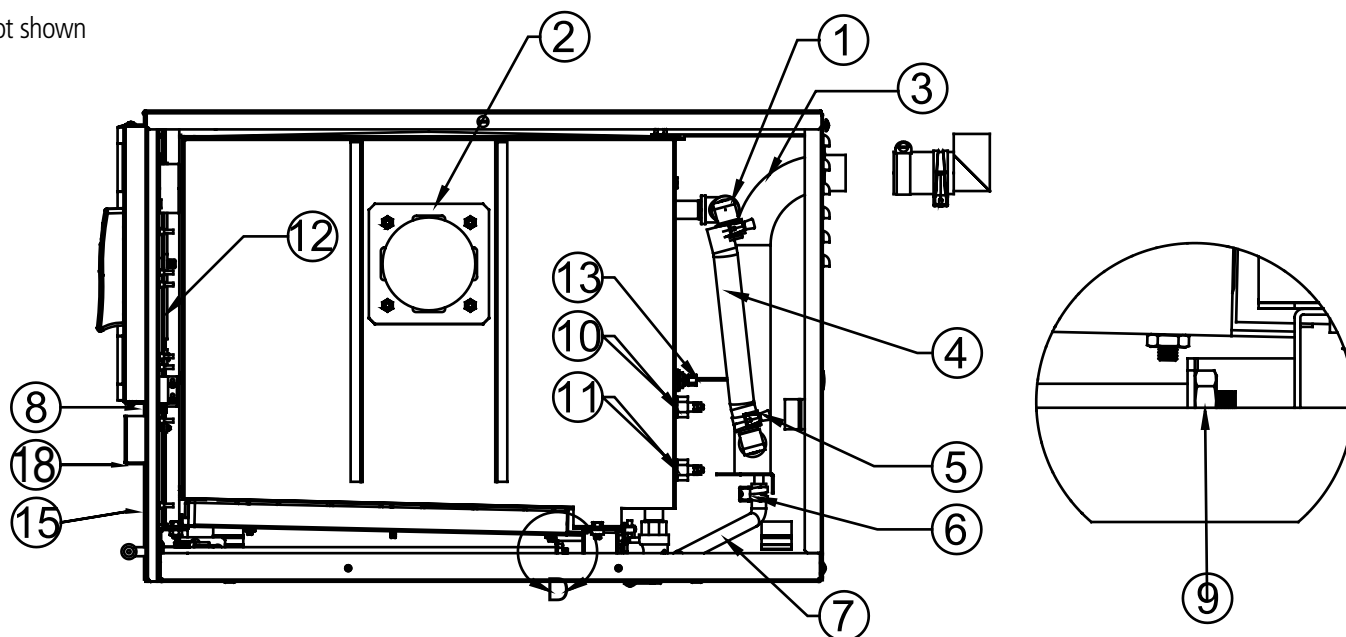
| No. | Description           | Qty. | Part No. |
|-----|-----------------------|------|----------|
| 1   | Blower wheel          | 1    | 096790   |
| 2   | Blower cover assembly | 1    | 139773   |
| 3   | Left side rack        | 1    | 124873   |
| 4   | Water Level Float     | 2    | 142689   |



## 7.1 Cavity Vent Assembly

| No. | Description                                                               | Qty. | Part No. |
|-----|---------------------------------------------------------------------------|------|----------|
| 1*  | Pressure Relief Valve 1/2 PSI<br>(Remove used plug if needing to replace) | 1    | 140867   |
| 2   | Kit Motor Assembly                                                        | 1    | 146880S  |
| 3   | Exhaust Assembly                                                          | 1    | 141512   |
| 4   | Hose                                                                      | 1    | 142528   |
| 5   | Constant Tension Band                                                     | 2    | 127524   |
| 6   | Clamp, Constant Tension                                                   | 2    | 127523   |
| 7   | Condensate Hose 9"                                                        | 1    | 92124    |
| 8   | Rocker Switch                                                             |      | 160920   |
| 9   | Drain Actuator Shaft                                                      | 1    | 141074   |
| 10  | High Float                                                                | 1    | 142689   |
| 11  | Low Float                                                                 | 1    | 142689   |
| 12  | PC Control Board                                                          | 1    | 160648   |
| 13  | Air Temperature Probe                                                     | 1    | 085187   |
| 14* | Shaft Grip                                                                | 1    | 141668   |
| 15  | Remote Reading Dial Thermometer                                           | 1    | 141055   |
| 16* | Overlay (Front Panel Lower)                                               | 1    | 141070   |
| 17* | Overlay (Front Panel)                                                     | 1    | 160523   |
| 18  | Hour meter                                                                | 1    | 149295   |

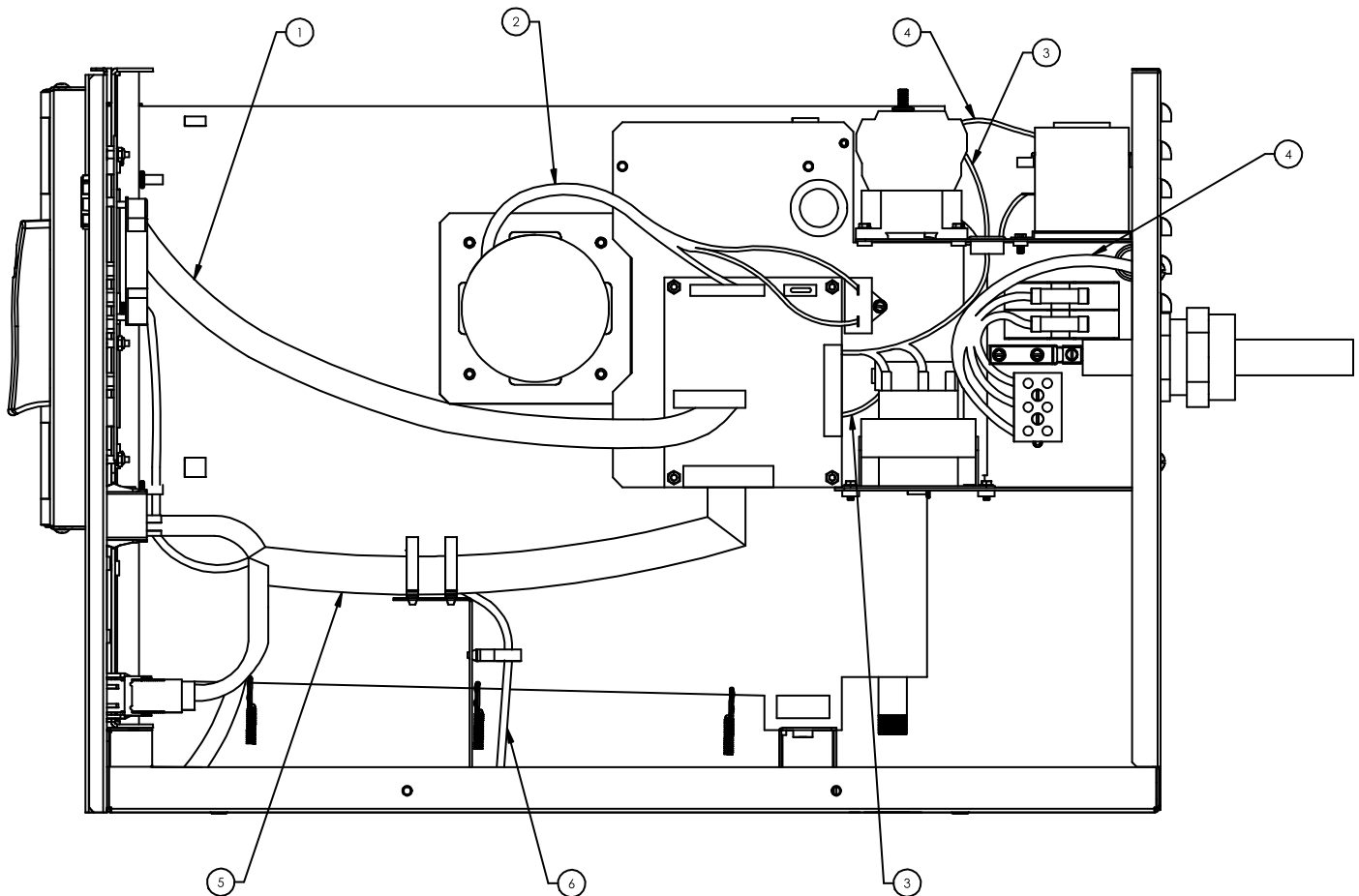
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## 7.2 Control Board and Wiring Harnesses

| No. | Description                         | Qty. | Part No. |
|-----|-------------------------------------|------|----------|
| 1   | Harness, VRC Control to Relay Board | 1    | 160879   |
| 2   | Motor 1/15HP 2-Pole                 | 1    | 096739   |
| 3   | Harness, VRC Low Voltage            | 1    | 160875   |
| 4   | Harness, Steamer High Voltage       | 1    | 160874   |
| 5   | Harness, VRC Forward                | 1    | 160876   |
| 6   | Harness, VRC RTD to Control Board   | 1    | 160878   |
| 7*  | Harness, VRC Auto-Fill              | 1    | 160877   |

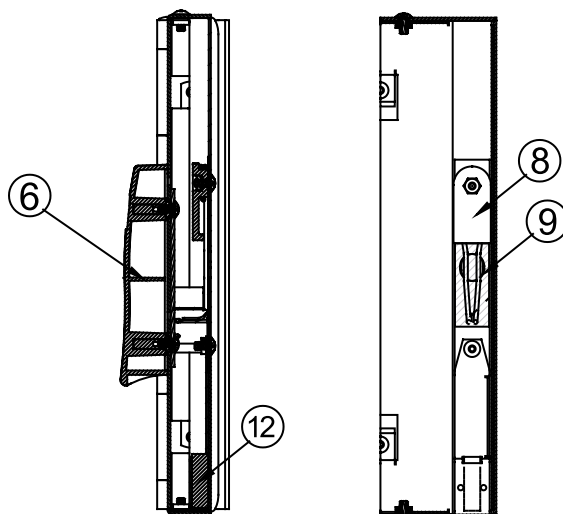
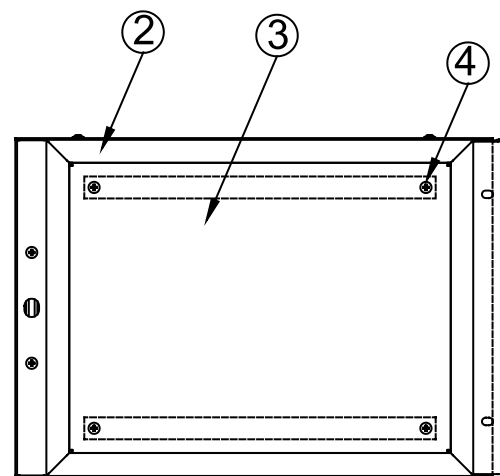
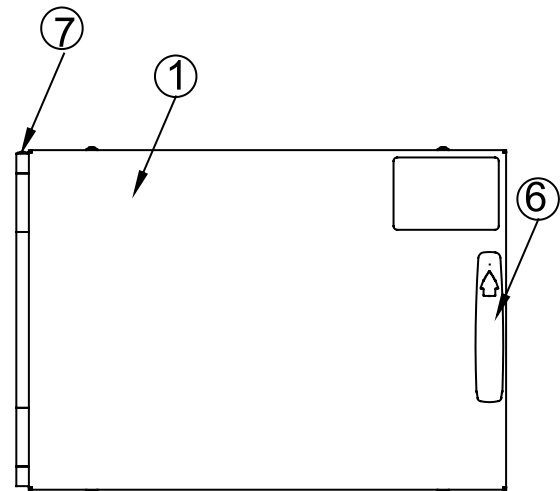
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## 7.3 Door Assembly (140749)

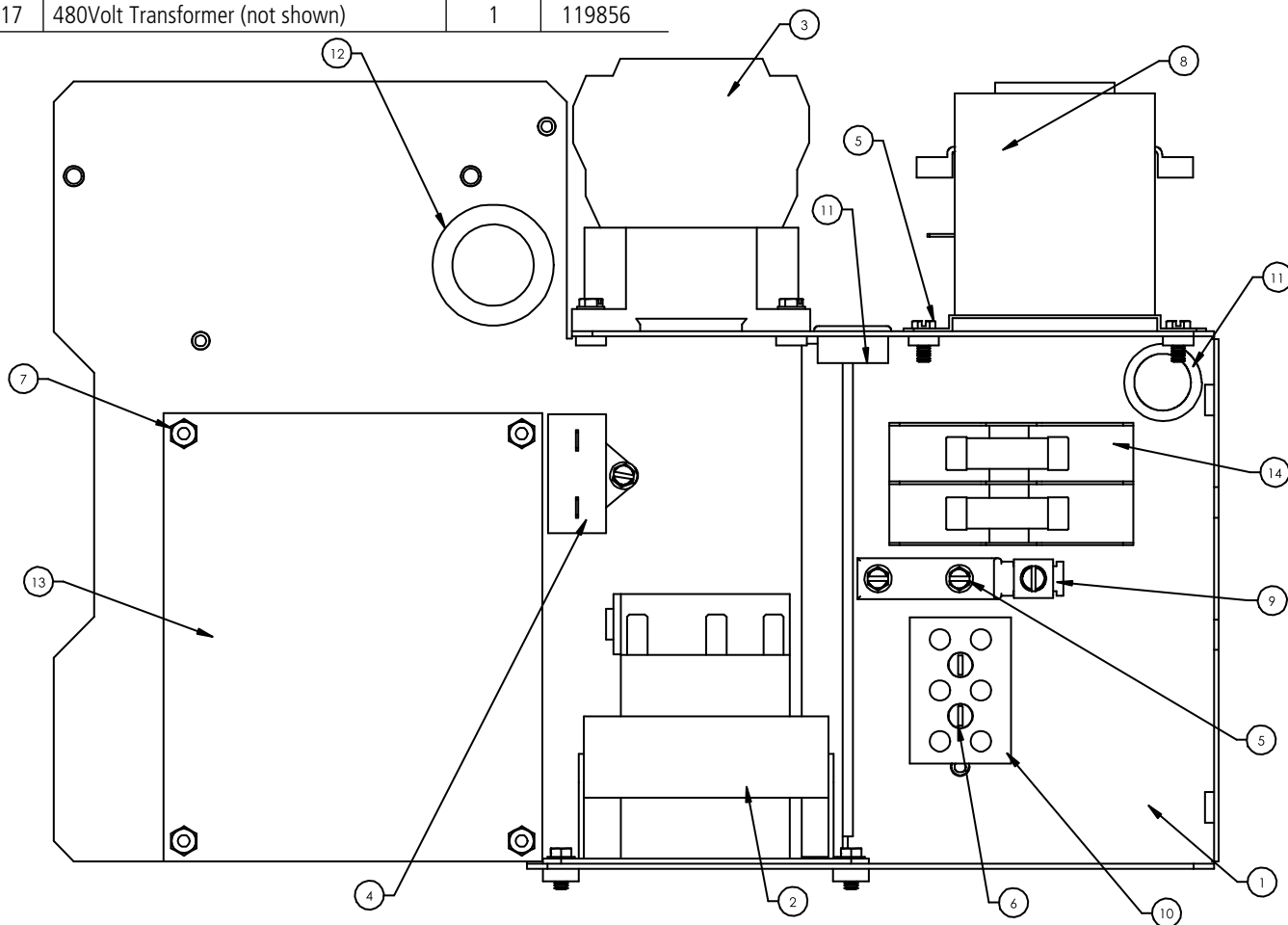
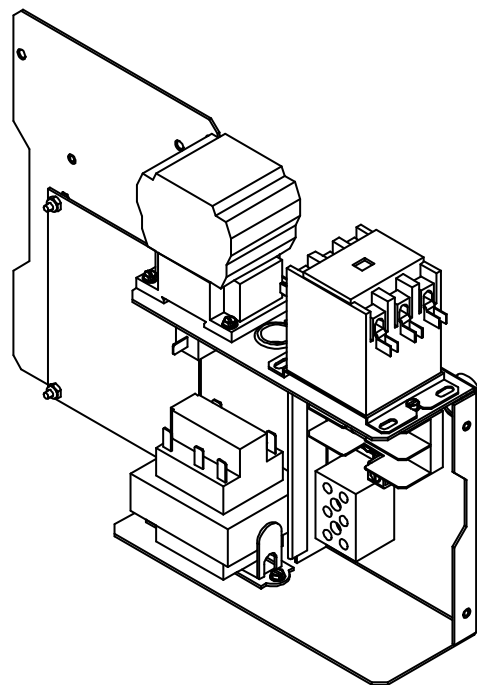
| No. | Description       | Qty. | Part No. |
|-----|-------------------|------|----------|
| 1   | Outer Door Panel  | 1    | 140750   |
| 2   | Gasket            | 1    | 140748   |
| 3   | Inner Door Panel  | 1    | 140751   |
| 4   | Truss Head Screws | 6    | 005764   |
| 5   | Hex Head Screws   | 2    | 005608   |
| 6   | Door Handle       | 1    | 129723   |
| 7   | Door Hinge        | 1    | 140755   |
| 8   | Door Cam          | 1    | 074252   |
| 9   | Latch Assembly    | 1    | 140752   |
| 10* | Door Spacers      | 4    | 071206   |
| 11* | Insulator Board   | 1    | 140754   |
| 12* | Block and Magnet  | 1    | 069762   |

\*Not shown



## 7.4 Electrical Components 208/240/480 Volts

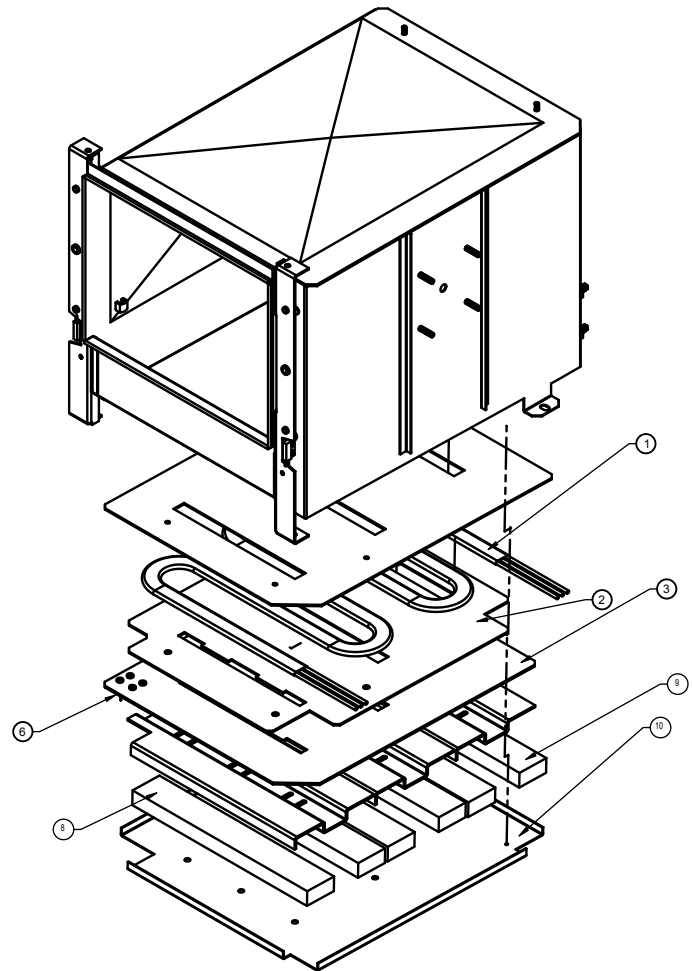
| No. | Description                               | Qty. | Part No. |
|-----|-------------------------------------------|------|----------|
| 1   | High Voltage Panel                        | 1    | 160488   |
| 2   | Transformer, 75VAC                        | 1    | 121716   |
| 3   | Contactor, 3-Pole                         | 1    | 144418   |
| 4   | Capacitor Foil 3 Mfd                      | 1    | 096813   |
| 5   | Screw Hex Slotted Washer Head Cap         | 11   | 069789   |
| 6   | Screw Round Head 8-32 1 1/4"              | 2    | 005056   |
| 7   | Nut Lock 6-32                             | 4    | 119855   |
| 8   | Contactor, 3-Pole 30Fla                   | 1    | 148102   |
| 9   | Mechanical Lug, Ground, #2-#8             | 1    | 106412   |
| 10  | Terminal Block 3-Pole                     | 1    | 003888   |
| 11  | Bushing Snap 11/16" I.D.                  | 2    | 012864   |
| 12  | Bushing Snap 1" I.D. x 1-3/8"             | 1    | 097015   |
| 13  | Relayboard, Steamer                       | 1    | 160649   |
| 14  | Fuse Block Assy                           | 1    | 160919   |
| 15  | Harness, VRC Low Voltage (not shown)      | 1    | 160875   |
| 16  | Harness, Steamer High Voltage (not shown) | 1    | 160874   |
| 17  | 480Volt Transformer (not shown)           | 1    | 119856   |



## 7.5 Heater Element Assembly

| No. | Description                                        | Qty.  | Part No. |
|-----|----------------------------------------------------|-------|----------|
| 1   | Heater Element Replacement Kit<br>208 volts 9 KW   | 1     | 143323   |
| 1   | Heater Element Replacement Kit<br>240 volts 9 KW   | 1     | 143324   |
| 1   | Heater Element Replacement Kit<br>480 volts 9 KW   | 1     | 143325   |
| 2   | Heater Support Bracket                             | 2     | 142561   |
| 3   | Heater Support Bracket<br>with Hi-limit Thermostat | 1     | 143037   |
| 4*  | Lock Washers, #10                                  | 6     | 005654   |
| 5*  | Hex Nuts 10-32                                     | 6     | 013613   |
| 6   | Hi-limit Thermostat                                | 2     | 141661   |
| 7*  | Round Head Screw<br>6-32 x 3/16"                   | 4     | 158599   |
| 8   | Heater Insulation 13"                              | 1     | 142510   |
| 9   | Heater Insulation 15"                              | 1     | 142357   |
| 10  | Insulation Plate Support                           | 1     | 142551   |
| 11  | Heat Transfer Compound                             | 40oz. | 143409   |

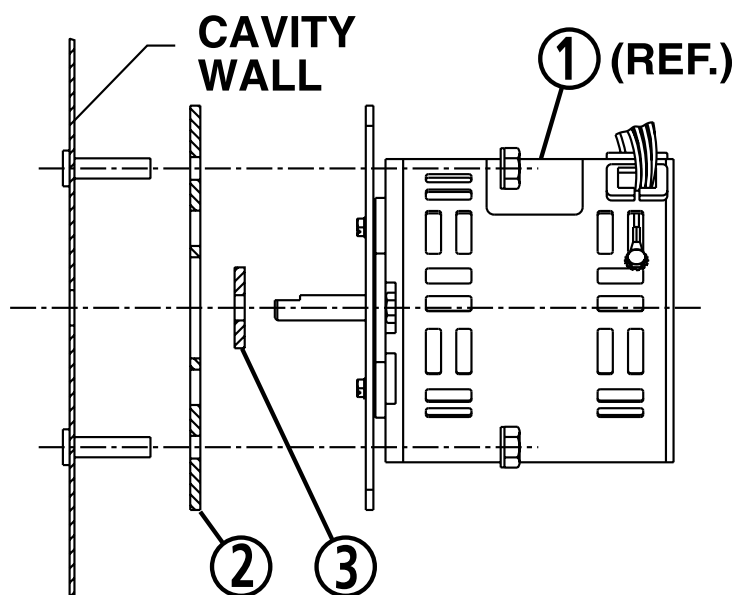
\*Not shown



## 7.6 Motor Assembly

| No. | Description          | Qty. | Part No. |
|-----|----------------------|------|----------|
| 1   | Motor Assembly (Kit) | 1    | 146880S  |
| 2   | Motor Insulator      | 1    | 094135   |
| 3   | Motor Shaft Seal     | 1    | 096868   |
| 4*  | Keps Nut 1/4" -20    | 4    | 012940   |
| 5*  | Blower Wheel (Fan)   | 1    | 096790   |
| 6*  | Set Screw            | 1    | 096789   |

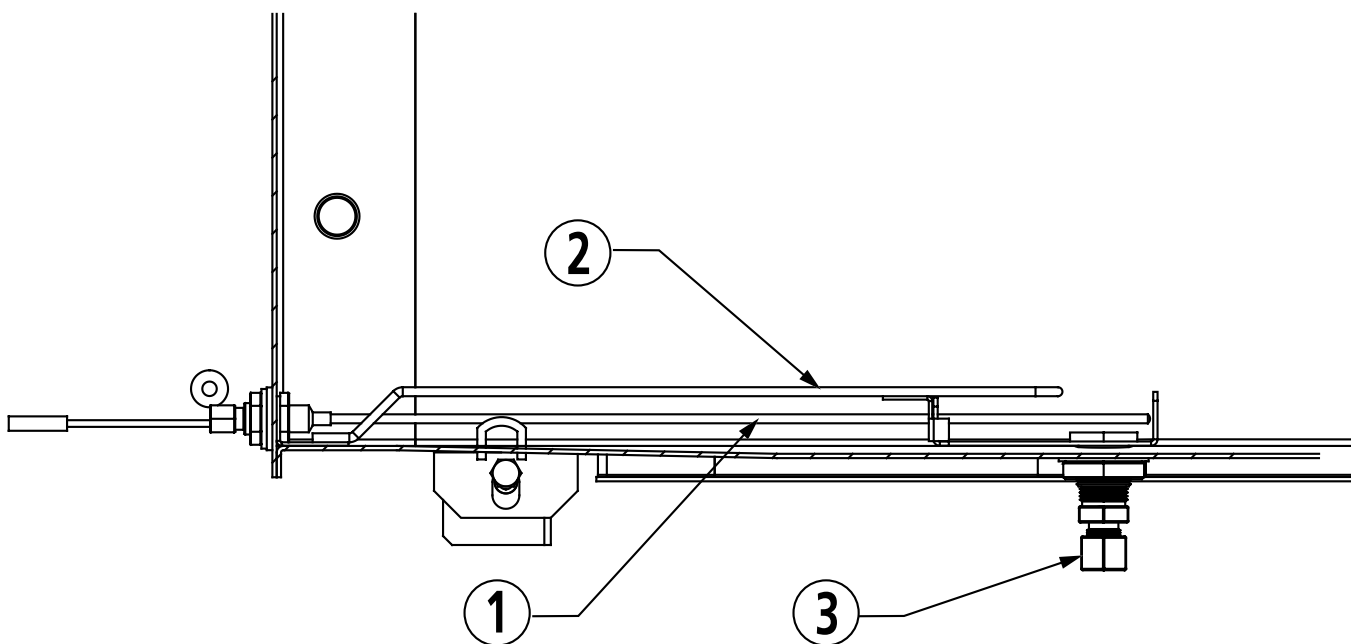
\*Not shown



## 7.7 Float Assemblies

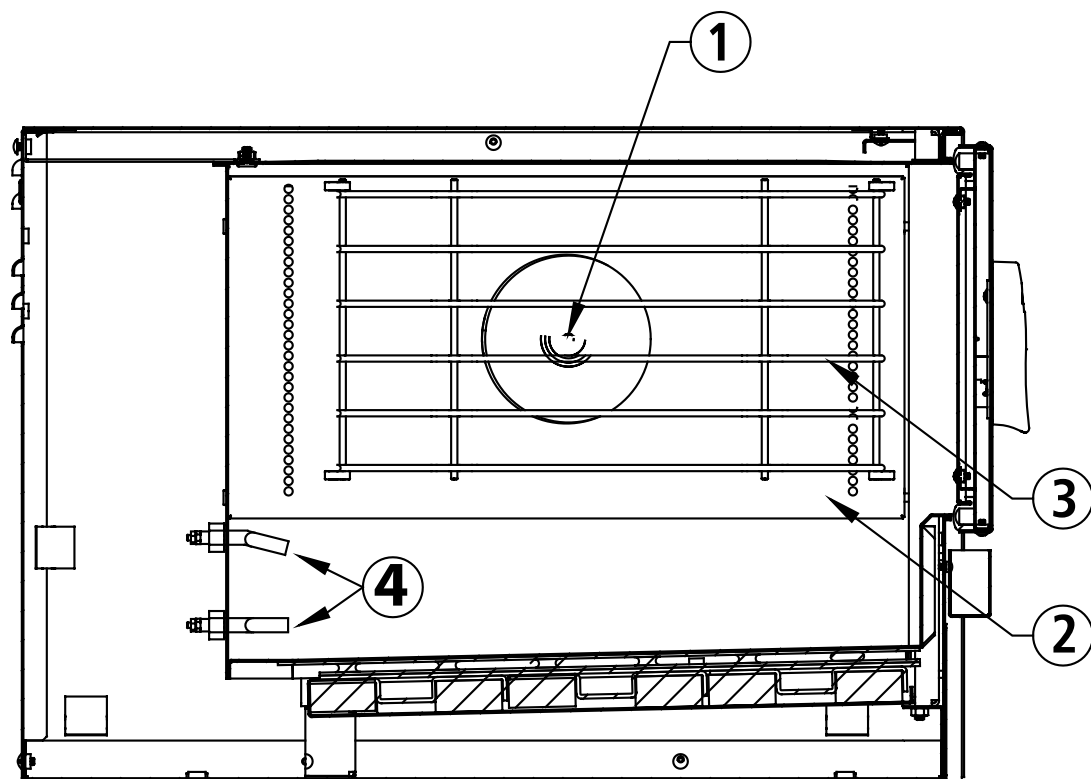
| No. | Description                    | Qty. | Part No. |
|-----|--------------------------------|------|----------|
| 1   | Cavity Air Temperature Probe   | 1    | 085187   |
| 2   | Probe Protector Assembly       | 1    | 074827   |
| 3   | Compression Nut 1/8"           | 1    | 071284   |
| 4*  | Probe Male Fitting             | 1    | 071217   |
| 5*  | Probe Nut 7/16"-28             | 1    | 070452   |
| 6*  | Probe Washer                   | 1    | 071253   |
| 7*  | Fiber Washer                   | 1    | 071252   |
| 8*  | Probe Fitting                  | 1    | 071231   |
| 9*  | Remote Reading Thermometer     | 1    | 141055   |
| 10* | Temperature Gauge Bulb Fitting | 1    | 141058   |
| 11* | Jam Nut 3/4"-16                | 1    | 141056   |
| 12* | Fiber Washer 3/4"              | 1    | 141069   |
| 13* | Flat Washer 3/4" SS            | 1    | 114816   |
| 14* | Compression Fitting 3/8"       | 1    | 141057   |

\*Not shown



## 7.8 Interior and Exterior Cabinet

| No. | Description           | Qty. | Part No. |
|-----|-----------------------|------|----------|
| 1   | Blower wheel          | 1    | 096790   |
| 2   | Blower cover assembly | 1    | 140785   |
| 3   | Left side rack        | 1    | 140782   |
| 4   | Water Level Float     | 2    | 142689   |



## General Specifications

### Atmospheric Steamer

The Vortex100 Connectionless Steamer has an electric heated water reservoir to provide atmospheric steam at a temperature of approximately 212°F, at sea level. The water reservoir has electric water level floats. When filled to the high water float, it has a capacity of four gallons.

### Controls

- 10 Hour digital timer
- ON-OFF rocker switch
- A continuous steam setting (MANUAL)
- An ADD WATER light to indicate water needs to be added to the reservoir
- READY indicates the unit is at or above the holding temperature of 160°F
- Three lighted push buttons
  - MANUAL for continous steam
  - TIMED for timed steam
  - HOLD for holding for a temperature of 160°F

### Performance Features

- The steamer comes up to ready in about 20 minutes from a cold start
- A side mounted fan provides efficient steam distribution throughout the cavity
- An ADD WATER light to indicate water needs to be added to the reservoir, or the steamer will automatically shut down
- To drain the water reservoir, turn the drain handle to the OPEN position, and the water will drain into the drain pan below the cavity
- 15 second delay before motor starts each time door is opened

### Water Supply Requirement

No water hookup is required. (manual fill)

## Electrical Specifications

Electrical requirement are, 208, 240 or 480 volts, single (208 or 240 volts steamers) or three phase power supply.

**Note:** 480-volt steamers are three phase only.

The three phase steamers are shipped with a cord set ready to plug in.

### VRC-3E

| Voltage | Phase | KW | Amperage | NEMA Connector #             |
|---------|-------|----|----------|------------------------------|
| 208     | 3     | 9  | 25       | 15-30P                       |
| 240     | 3     | 9  | 22       | 15-30P                       |
| 480     | 3     | 9  | 11       | CS8165C Hubbel or Equivalent |
| 208     | 1     | 9  | 44       | 6-60P                        |
| 240     | 1     | 9  | 38       | 6-50P                        |

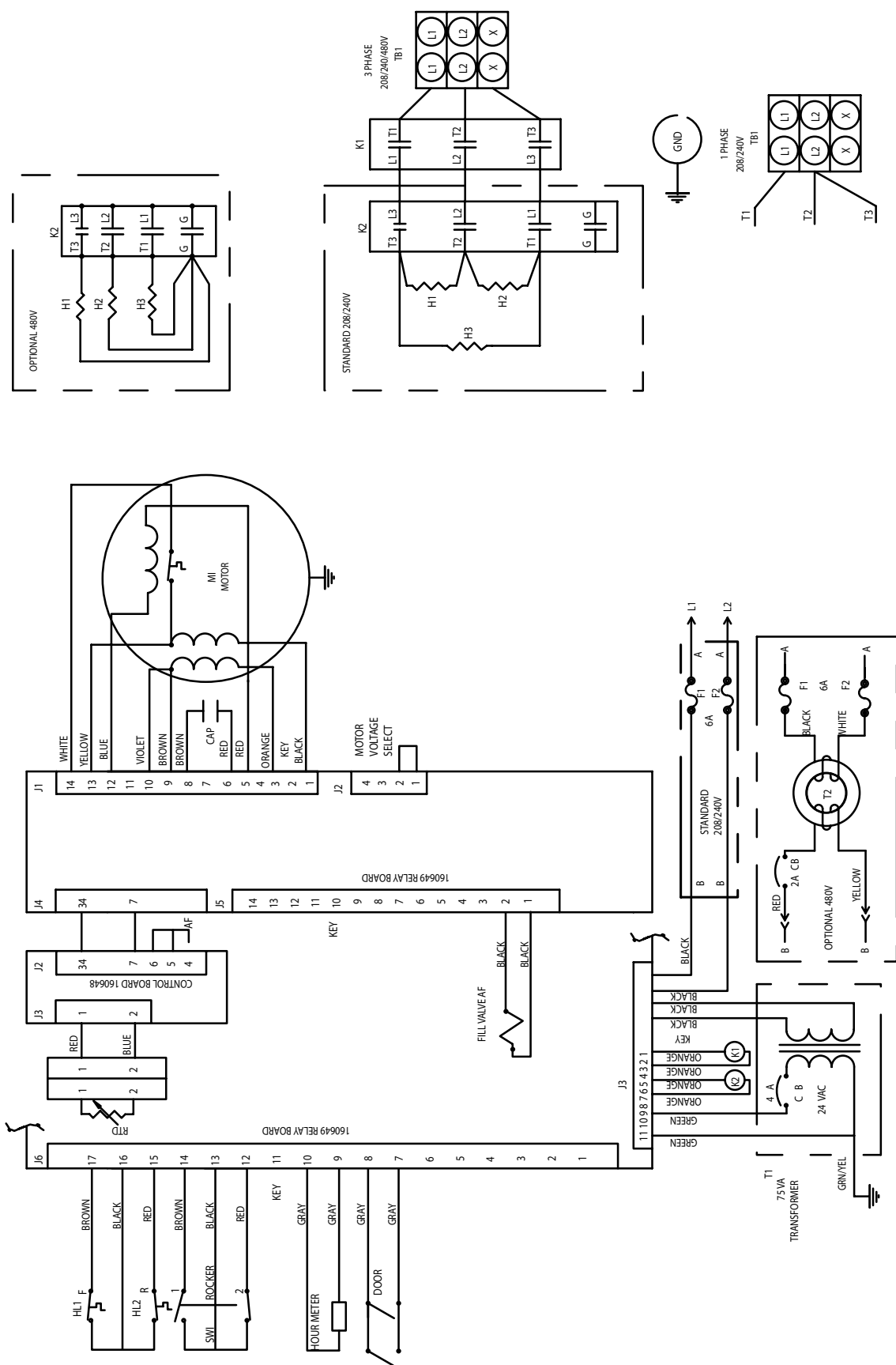
### VRC-6E

| Voltage | Phase | KW | Amperage | NEMA Connector #             |
|---------|-------|----|----------|------------------------------|
| 208     | 3     | 12 | 34       | 15-50P                       |
| 240     | 3     | 12 | 29       | 15-50P                       |
| 480     | 3     | 12 | 25       | CS8165C Hubbel or Equivalent |
| 208     | 1     | 12 | 58       |                              |
| 240     | 1     | 12 | 50       |                              |
| 208     | 3     | 10 | 28       | 15-50P                       |
| 240     | 3     | 10 | 25       | 15-50P                       |
| 480     | 3     | 10 | 13       | L16-20P                      |
| 208     | 1     | 10 | 49       |                              |
| 240     | 1     | 10 | 43       |                              |

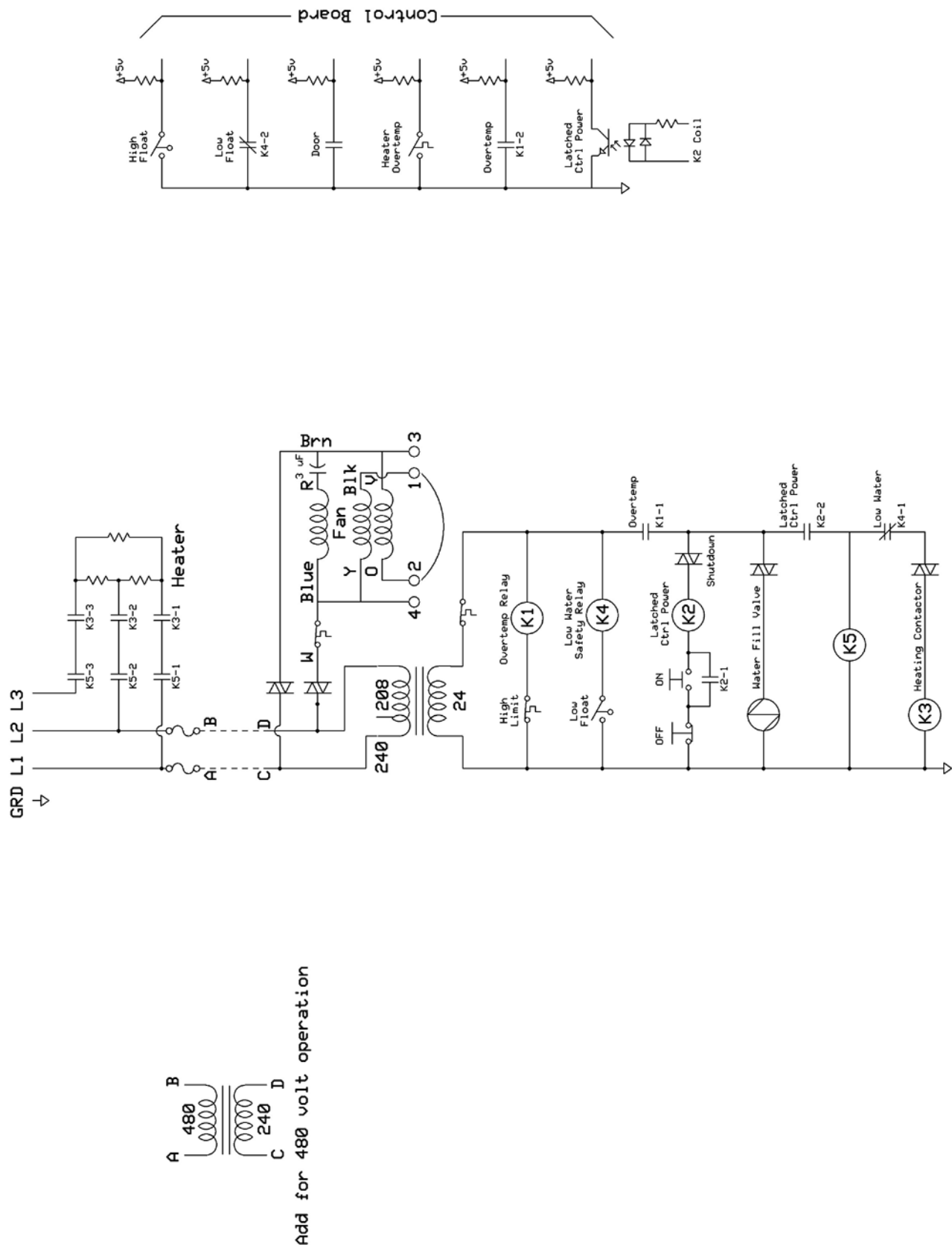
Refer to page 3-1 for further details on electrical requirements.

# WIRING DIAGRAM • VRC-3E, VRC-6E

**GROEN®**



153047 VRC WIRING DIAGRAM



## Notes

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